approach

SEPTEMBER 1964 THE NAVAL AVIATION SAFETY REVIEW

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TECHNOLOGY & SCIENCE

TAIL FIRST

Last of a Series on Handling Landing Gear Malfunctions

In a list of odd-ball ways to land an airplane, the "nose wheel down, main gear up" configuration is probably the oddest.

For one thing, it is rather unique. There are only about a dozen examples available. Then too, the amount of damage received seems to be less than might be imagined: There are seven incidents and four accidents.

A man once remarked that an airplane needs a lot of talent to produce a "pegleg" situation. In this respect the A-3 is the star

Refer to Nov '63 for Nosewheel-Up and June '64 for One Main Gear-Up Landings

Nose wheel down, Main gear up.

of the show with six performances. Other talented aircraft, with one performance apiece, are the F-8, F-3, A-4, T-28 and T-2.

How did these aircraft get this way?

A very small percentage of the cases (two out of eleven) can be blamed fairly on the pilots. An A-3 hit the ramp and boltered with the right main mount bent backwards and a stub hanging where the left wheel had been. An A-4 pilot inadvertently dropped the wheels at high speed and the main struts broke aft.

The remaining nine airplanes dumped the problem in the pilot's lap through such things as broken hydraulic lines, reversed components, and so forth.

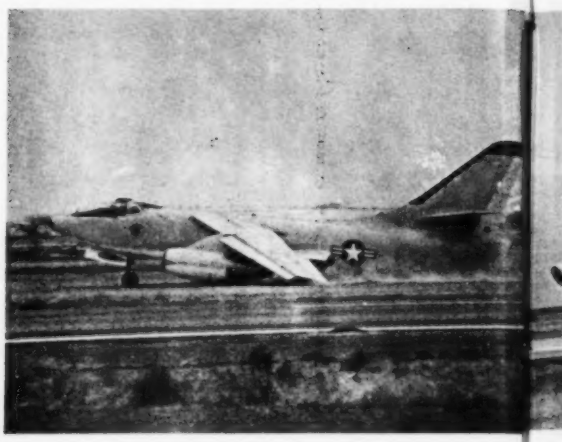
No injuries were reported in any of the landings and the actions of the airplanes involved were relatively uncomplicated.

For both arrested and non-arrested landings the runouts were generally straight down the runway without any violent swerve at the end. What you may not expect is the length of the ground roll, or should we say slide, in the event field arrestment is not possible: From initial touchdown to stop the total distance will probably approach that distance required for a short field landing.

Drop tanks prevented tail from dragging when pilot made nose wheel down, Main gear up landing. Practically a normal landing.

A listing of the cases will give some specifics on each model aircraft:

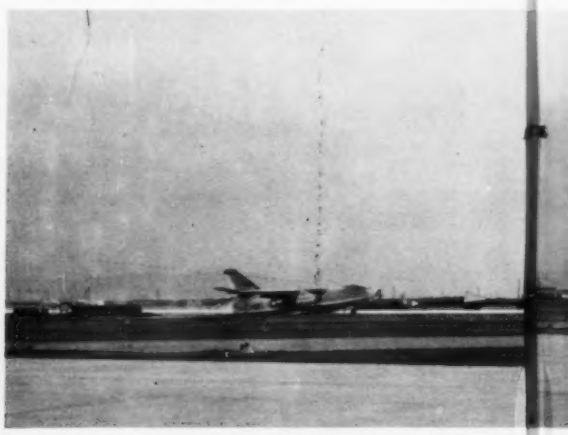
- F-3 utility hydraulic failure. Unable to lower main gear. Engaged arresting gear on second pass. Chain failed, aircraft slid 3530 feet on runway, 346 feet off side. Substantial damage.
- A-4 gear handle lowered at high speed. Main gear folded back. Nose down and locked. Runway foamed and arrested landing made. Minimum damage on landing. Substantial damage attributed to airborne phase of flight.
- T-28 main gear jammed in retracted position. Foam strip laid on runway. "Plane touched down easy and slid straight down center of runway," said the pilot. Slight swerve before stopping. Incident damage.
- F-8 hydraulic check valve reversed. Main gear would not lower. Arrested landing. Incident damage.
- T-2 main gear jammed in intermediate position. Foam strip on runway and arrested landing. Incident damage.
- A-3 hydraulic line broken. Nose wheel and tail skag down, both main wheels down but unlocked. Runway foamed. Touchdown at midfield and main gear collapsed. Engaged abort gear 1500 feet from end of runway. Slight swerve, stopped 100 feet off side. Incident damage.
- A-3 hit ramp and boltered. Starboard main mount bent back, stub on port side. Skag and tail hook damaged. Foam strip in vicinity of arresting gear. Arrestment unsuccessful. From touchdown to stop distance about 3500 feet. Stopped on edge of runway. Substantial damage due to the ramp strike.
- A-3 hydraulic line severed by blown main tire. Main mounts and skag up. Foam strip 4000 feet long, 60 feet wide. Touchdown 4000 feet in front of Morest gear. Right swerve following engagement collapsed nose wheel. Overhaul damage.



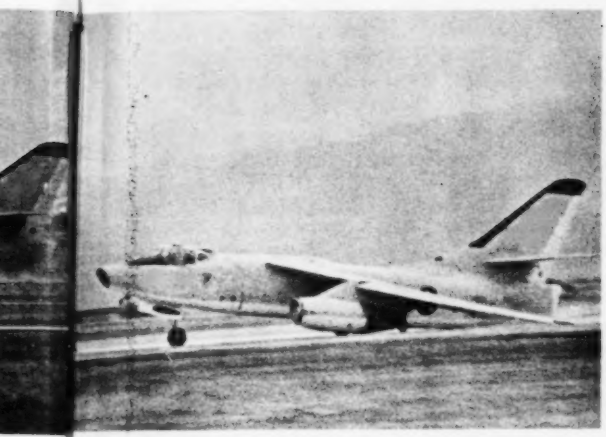
Above: Final resting place after long tail slide in foam. No arresting gear. Incident damage.

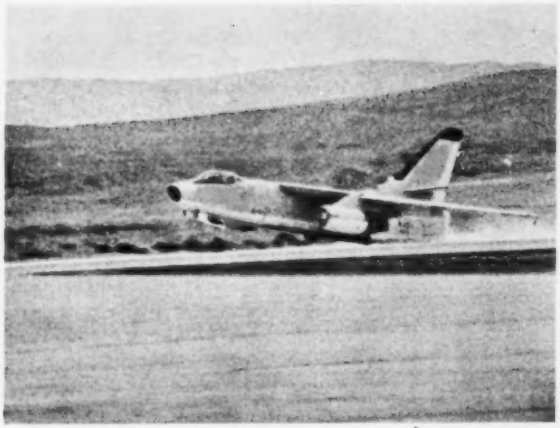
- A-3 on cat shot. Loose gear sheared hydraulic line. Main gear down but not locked. Foam strip laid. Main gear collapsed on touchdown. Engaged midfield A-gear. Port wingtip touched runway just prior to stop. Slight swerve. Incident damage.
- A-3 utility hydraulic failure. Unable to lower main gear; 3000-foot length foam strip laid. No arresting gear. Touchdown about 1000 feet beyond threshold. Aircraft slid 3000 feet with slight swerve at end. Stopping 100 feet off side of runway. Incident damage.
- A-3 utility hydraulic failure. Main mounts extended but unlocked. Foamed 2000-foot strip. Main mounts collapsed on touchdown. Engaged arresting gear. Slight swerve at end of foam, stopped just off runway. Total distance from

Spray flies as tail touches foam



Morest engagement but swerve starts



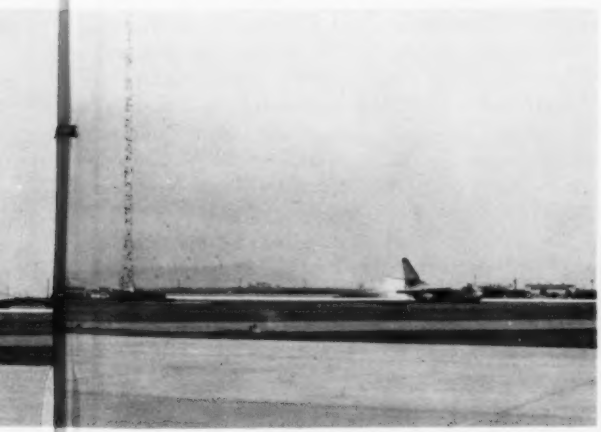


touchdown 2300 feet. Incident damage.

In conclusion you can see there is not much drama involved in the nosewheel-down, main-up situation. Though rare, the results are relatively routine. But if it should happen to you, consider these points:

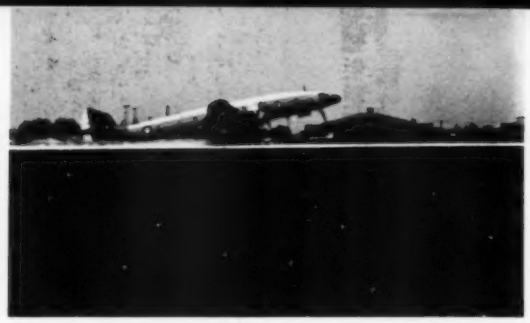
- The evidence indicates it is preferable to leave the nose wheel down rather than retract it and make a belly landing (it may not be possible to bring the nose wheel up anyway).
- A foamed runway appears superior to a dry one, especially if arresting gear is not used.
- Arresting gear is a satisfactory method of recovery (in case of a fly-in arrestment the aircraft weight and speed must be compared to the A-gear capabilities).
- Crew injury is improbable and major damage as a result of the landing is unlikely.

Above: Small ones as well as big ones have difficulty. Incident damage to this T-2.



Nose collapses near end of runout

Nose area damaged but crew safe



At 1500 on the afternoon of 3 May a C-121J assigned to VW-1 began a GCA to an overseas base. To the 75 Souls on Board there was no inkling that the actual touchdown would be delayed for 3½ hours and the landing somewhat unorthodox for a CONNIE.

Another Tail First Landing

When lowering the gear for landing, an unsafe nose gear indication was experienced. Several re-cycles gave the same results and the flight engineer was sent down in the forward baggage compartment to observe the nose gear action while it was cycled. "At this inspection," he said, "hydraulic fluid was pouring over the strut and down-lock mechanism."

The pilots then orbited the area and tried various methods to get the nose gear into a locked position. It was noted that it was not an instrument malfunction as the nose gear would trail approximately 30 degrees when the secondary pumps were taken off the line with the gear handle down, proof that the gear was not locked down.

Technical advice from the ground was requested and offered but it was soon clear that it would be necessary for the aircraft to land with the nose gear not locked down.

Now all thoughts were turned to emergency landing procedures.

A suggestion that all gear be retracted for a belly landing was rejected by the plane commander. At least one other *Constellation* has made a nose-wheel-up landing with no personnel injury and limited damage. In this particular case the nose was lowered to the runway before elevator control was lost and the aircraft slid to a stop with the tail in the air.

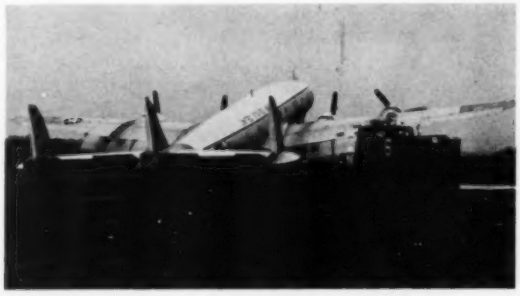
"A discussion with the tower ensued about foaming the runway," said the plane commander, "and we were informed that the first half would be foamed. I immediately requested that they foam from the 3000-foot mark which they agreed to do.

"The passengers were briefed again, this time by myself, and I tried to reassure them that we could get them down safely and I told them of our plan of holding the nose wheel off and moving some people aft on landing. We had 15 squadron people on board who took the forward seats. On command of the 3rd pilot stationed in the cabin, they were to walk aft, two at a time, when the main mounts touched the runway.

"I specifically instructed them not to run aft, but

walk on command. I recognized the risks they were taking but decided this procedure was the only way to get the CG limit where we needed it. We had figured the CG at 28% for landing and 34% with 15 people all the way aft. No one was to move until the plane was firmly on deck.

"We ruled out any reversing of engines on landing and recognized that any steering would have to be with rudders first and emergency brakes as a last resort. The final step we agreed on was that if the aircraft did fall over on the nose we would feather all engines when it became apparent the nose was collapsing."



C-121J looks tired in tail-dragging pose.

Full flaps were lowered on final approach. The plane touched down at about 1500 feet from the approach end in a slightly nose high altitude. At this point 8 personnel moved to the rear from the forward part of the cabin. The tail settled considerably in conjunction with the pilots pulling back on the yoke.

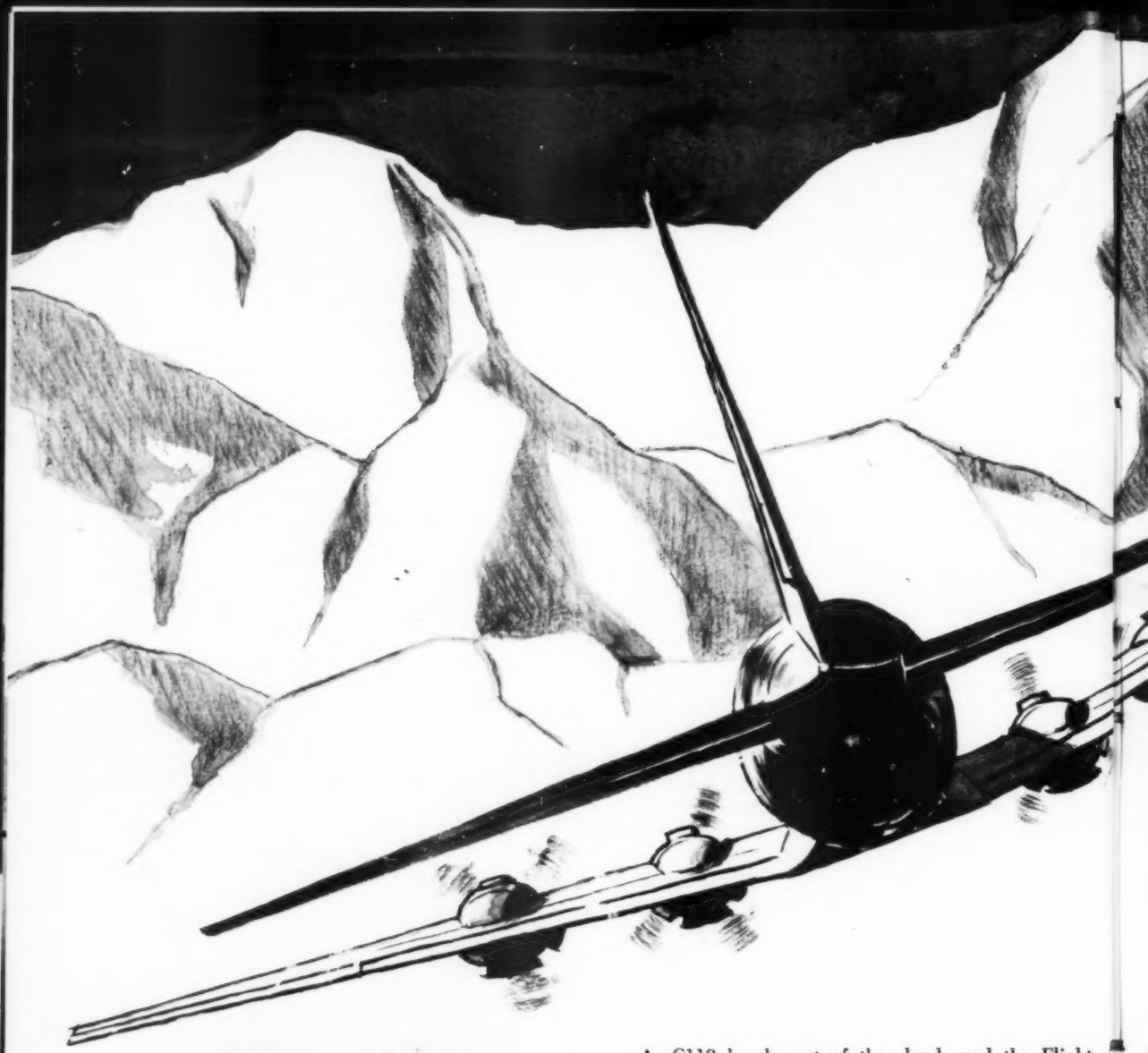
As the aircraft entered the foam the tail began to drag slightly on the runway. It stayed in contact with the runway during the entire rollout. The foam ran for 3800 feet (a 100-foot wide blanket) and the aircraft slid through this, continued for 1000-feet on dry runway and came to stop 250 feet from the upwind end. Total distance from touchdown to stop was 6000 feet.

A lift truck, previously padded with mattresses, was placed under the nose section and lines were passed over the aft fuselage to keep the tail down while attempts were made to pull the nose wheel into the locked position. After a crewmember discovered a bent actuating rod and disconnected it, the gear locked easily. Passengers were then removed one at a time. The nose dropped gently to the lift truck and was lowered further by the lift truck to the runway.

"We towed the plane to the parking ramp," said the 3rd pilot, "thanked the passengers for their cooperation and went to the club for a drink."

And if the crew had more than one drink nobody should have objected. It isn't often you can do this with a 100,000 pound airplane and get away with an incident report.

SHEARED GEAR SAVE—Latest to use "Heli-pad" recovery is H&MS-26 AMD of 2nd Marine Air Wing. Timely coordination between pilots and ground crew kept incident from becoming an accident. At left, pilots maintain chopper in hovering position while maintenance crew removes damaged gear. At right, landing is made on mattress-covered flat bed trailer with no further damage.



630 Miles Off Course

By LT G. A. Wells

A C118 breaks out of the clouds and the Flight Engineer remarks to the 1st pilot, "Funny looking cloud bank ahead!"

Moments later the aircraft is in a sharp left turn in order to parallel the coast of Greenland near Angmagssalik, *630 miles north of course*. After three hours on instruments the aircraft had broken out of the clouds at 10,000 feet pressure altitude and directly ahead were the 11,000-foot snow-and-ice-covered peaks of Greenland's eastern coast. The broken clouds of the coast had prevented a certain catastrophe and probably one more aircraft accident which would never have been solved. In the analysis of this navi-

gational fiasco lie valuable lessons for present and future navigators and perhaps the key to *one or more aircraft lost at sea.*

The aircraft was manned by a Navy MATS crew. Prior to sunrise they had departed Prestwick AFB, Scotland, bound for Harmon AFB, Newfoundland. Prestwick was the first refueling stop on a regular scheduled flight originating at Rhein Main AFB, Frankfort, Germany, and terminating at an east coast MATS base. The 2000-mile overwater leg was a familiar one to the crew, a great circle track complete with unpredictable early fall North Atlantic weather.

On departure all navigation equipment was in working order and the navigational aids available during the flight included Celestial (day and night), Loran, Consol, Pressure Pattern (lateral displacement and Bellamy drift angle), VOR for the overwater departure, Tacan at arrival, Ocean Station Vessels, and of course, dead-reckoning.

The navigator who had the table until relieved off Greenland was on the return leg of his first trip as a newly qualified MATS Transport Navigator. He had progressed normally through the squadron training syllabus including a thorough local ground school followed by several instruction trips and a flight check given by one of the squadron's most experienced Navigation Flight Examiners. The only negative comments in his training jacket were that two instructors had noted he failed on occasion to cross-check his latest navigation information with all available aids—a common comment on inexperienced navigators.

Shortly after level-off, a compass deviation check was completed by the navigator. The RMI primary compass system had a deviation error of 50 degrees east on both pilot and copilot systems. The G-2 system and B-21 standby compass had less than 5 degrees deviation. Plus or minus three degrees deviation was considered normal on RMI and G-2 systems. After double-checking the deviation the navigator waited 1 hour and 30 minutes after takeoff to inform the pilot of the excessive deviation. Shortly after informing the pilot of the excessive deviation he had the pilot take up the flight plan compass heading 10W to 20W on the pilot's G-2 compass. Neither pilot had adequately cross-checked the compasses during climbout. No analysis was made of what effect steering for an hour and a half with 50 degrees E deviation would have had on the track. The navigator had counted on a level-off radio fix from the pilot which had not been obtained and was now overdue for his first fix. He had spent the first 1 hour and 30 minutes setting up the navigation table, taking the deviation check, making out the Airep for 56N 10W, and drawing up the howgozit.

For the first fix the loran set was used to obtain loran lines of position from 1L6 and 1L7. The 1L6 course LOP was logged but not plotted because, as the navigator later stated, "It appeared to be too far north." Additionally a consol LOP was obtained and plotted in the wrong dot sector and it provided a course line indicating the aircraft was on course.

In using consol lines of position a navigator is

faced with a problem of sector ambiguity. Consol plotting patterns consist of a series of dot and dash sectors plotted on consol charts. Once the navigator has taken his count, he resolves his count to a LOP which corresponds with 15 degree wide sectors on his chart which are labeled as dot or dash sectors. The ambiguity arises from the fact that every other 15-degree sector is an identically labeled sector (Dot or dash). This ambiguity must be resolved by a DR plot and/or cross-checking with other position information. In this case the navigator had all the information necessary to resolve the ambiguity by either method. However, his failure to analyze the effect of his initial deviation combined with the erroneously plotted LOP falling right on course set the stage for the fantastic chain of events which ensued. The 1L7 loran speed line combined with the erroneous consol LOP gave a good cut and a fix position was established. The consol bearing (ADF) was logged but not plotted. Using both loran lines, the consol bearing, and consol LOP (in the current sector) the navigator would have had a four LOP pin point fix 90 miles North of course. Also a DR plot in conjunction with a correct analysis of deviation would have fallen very close to the actual aircraft position.

As the leg progressed, the navigator continued to use consol (plotted in the wrong sector) for course lines and loran LOPs for speed lines, which were followed after sunrise with sun speed lines. The aircraft was erroneously fixed on course hour after hour. In hourly computing his latest wind by track-ground-speed method, the erroneous westerly track and correct northerly true heading gave the navigator a strong wind from the north. The navigator would then alter heading a few more degrees to the north to correct for the ever-increasing northerly wind. The aircraft's error with respect to course initially increased proportional to the expanding consol sectors and this error was accelerated by the hourly alterations to the north for the ever-increasing erroneous northerly wind. As true heading increased, computed wind velocity increased. This pattern was repeated for nearly seven hours and was terminated by the unexpected arrival off the coast of Greenland.

The Aircraft Commander had retired to the bunk after level off and contrary to his crew briefing had not been awakened until Greenland had been sighted. The navigator had not informed anyone of any difficulties although he later stated that he knew, "something was wrong."

Pressure altimeter and absolute altimeter readings were taken at 30-minute intervals but at no time was lateral displacement or Bellamy drift angle computed. Revised inflight winds were not obtained from any ground center or Ocean Station Vessel in order to check the questionable winds obtained by track-ground-speed method.

Shortly after the sharp turn to avoid hitting the Greenland coastal mountains the relief navigator obtained a position and the flight terminated at Harmon AFB, Newfoundland—very, very late and extremely low on fuel.

The corrective action taken by the squadron included a program to raise initial navigator qualification standards, and increased standardization at the Flight Examiner, Instructor, and Transport Navigator levels. Cross-checking of all available aids was emphasized and the importance of navigation to the squadron's mission reemphasized. The selection of Navigation Flight Examiners was reviewed and the selection board and Navigation Officers insured that the candidate for designation as Navigation Flight Examiner was professionally motivated and totally competent. The results were immediately apparent as pin-point quality navigation became the rule and not the exception.

When an aircraft and crew are lost due to navigation error, the results may not be as dramatic, nor the errors involved as obvious, as an approach turn stall at home field; however, the tragedy and loss is no less real.

LT G. A. Wells entered the naval service in 1959 immediately following his graduation from the University of Indiana. He was commissioned in October of 1959 and designated a Naval Aviation Observer (Navigator) in December 1960.

His first tour was with Naval Air Transport Squadron THREE at McGuire AFB where he was a Globally Qualified MATS Navigator Flight Examiner and the squadron Standardization Navigator.

LT Wells is currently assigned to TRARON 29 at NAS Corpus Christi as an In-Flight Navigation Instructor in TC-117D and T-29B aircraft.

'Omit' Position Report Procedures

By W. Thomas Deason, FAA Liaison, NASC

During recent field trips to the Air Traffic Service facilities and through discussion with controllers, it was brought to the attention of FAA Washington personnel that controllers were experiencing minor communications problems as a result of application of subject procedures. The problems consisted of:

(1) Difficulty in re-establishing radio contact with flights which had been advised to "Omit Position Reports";

(2) Pilot's failure to adhere to proper "Transfer of Control" communications procedures; and

(3) Pilot's soliciting requests to "Omit Position Reports."

The procedures are currently being evaluated for effectiveness but are proposed for adoption as a procedural standard. In view of this, the problems were discussed with user organizations who were requested to bring these problems to the attention of pilots.

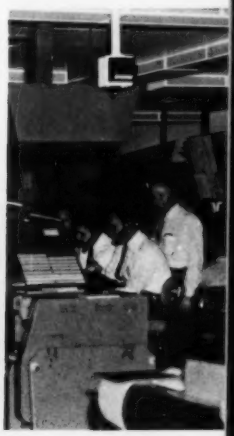
As a result of the FAA request the following excerpt was issued in a user organizational bulletin:

Important ATC Procedural Information For Flight Crews

Three problems arising since inauguration of "Omit position report procedures" are causing ATC problems . . . FAA requests these be brought to the immediate attention of flight crews.

Problem No. 1—Are You Listening? . . . many ARTC Centers report increasing difficulty re-establishing radio contact with flights which have been advised to "Omit Position Reports" . . . As a consequence, ATC is unable to issue amended clearance, traffic information or instructions to change over to next sector, etc. . . . was originally thought to be rash of radio failures, but this idea disproved when subsequent normal communications were re-established . . . problem might stem from pilots turning receiver volume down when in vicinity of ARTC transmitter and thus not hearing later call when flight is some distance from transmitter . . . or could just be that pilots were not listening closely enough . . . pilots are required to maintain constant listening watch on proper ATC frequency even though advised to "Omit Position Reports."

Problem No 2—If No Position Report, Give Estimate . . . many pilots seem unfamiliar with proper procedure for establishing communications contact with *next* ARTC *sector* particularly after being told to "Omit Position Reports" . . . in a nutshell, when position report is *not* required, give controller (in your initial call-up) your estimate over next compulsory reporting point along your route—even though you won't need to report there—and include present altitude, plus altitude to which you will climb or descend, if appropriate. . . .



Problem No. 3—Don't Call Me, I'll Call You . . . omission of position reports procedure is only applicable under radar control and when in the controller's opinion he will be able to adequately discharge his responsibilities considering traffic volume, etc. . . . FAA reports some pilots question controllers who don't advise them to "Omit Position Reports" and some try to induce controllers to permit omission of reports. . . . FAA fearful that controllers may be distracted trying to explain why unable to "Omit Position Reports" or might reluctantly succumb to constant pressures to grant request when it should not be granted . . . if controller does not volunteer "Omit Position Reports" assume he has good reason —don't badger him.

By 1st LT Steve Pollard USMC

IFR Arrival With Lost Comm

Approach Control was informed by center that a no radio jet was inbound. His takeoff time and ETE were passed to approach, and they calculated his approach clearance time to be 2030. His last assigned altitude was FL 370. His DD175 indicated a tacan approach and GCA at destination, and Seymour Johnson AFB was his alternate. When Approach Control picked him up, he was squawking the high altitude enroute code for his altitude. He proceeded, direct, to the Cherry Point tacan holding fix, and commenced holding. At 2030, he was observed to squawk mode 14. Cherry Point was below tacan minimums, so center was notified and all airspace up to and including FL 250 was cleared from Cherry Point directly to Seymour Johnson in anticipation of a missed approach. As the aircraft passed over Cherry Point, he was observed to squawk emergency, mode 1 code 00, and code 77. He landed safely at Seymour Johnson.

No doubt Approach Control was concerned about the no radio inbound, but probably not nearly as much as the pilot. He was in the soup at FL 370 midway between his takeoff point and Cherry Point when he lost his radio. He knew the weather was poor at Cherry Point, but it was forecast to be above tacan minimums. He double-checked the two-way radio failure procedures in his enroute supplement even though he was sure he knew them. He figured his approach time to be 2030 also, but was puzzled on the route he was to fly upon arriving over Cherry Point. He filed to Cherry Point, but intended to fly direct from his last high altitude reporting point to Cherry Point's tacan approach fix.

The enroute supplement says a no-radio aircraft is to maintain the last assigned altitude (or MEA) and figure his approach time to the navigational facility serving his destination fix. Should he hold over the tacan or over the fix? He held over the fix until 2030 at FL 370, then squawked mode 14 to let Approach Control know he was letting down to 20,000 feet to commence his approach. At tacan minimums, he squawked emergency, climbed to FL 250, and made an enroute tacan penetration to Seymour Johnson due to low fuel.

This was an imaginary situation, but a very possible situation to find yourself in someday. Giving some thought in advance to what you would do under these circumstances can remove a lot of uncertainty in your mind before this happens.

For the proper codes and modes to squawk during various phases of a hop, study the last few pages of the enroute supplement. Almost all of the U. S. is under radar control. The reasonable decision as to when and where to squawk emergency is up to you. Squawking the arrival mode can be termed good headwork. After a lost comm missed approach you could be in serious trouble, so an emergency squawk could be appropriate.

The FLIP document specifies that a lost comm aircraft is to hold over the navigational facility serving the destination approach fix until the approach clearance time, then penetrate. It does not discuss the specific procedures for tacan. It is very difficult to hold in the cone of confusion, as well as completely fouling up your approach time due to the distance between the tacan and the fix. A way of solving this problem before it happens is to file on the DD 175 direct to the approach fix,

then simply fly via flight planned route, hold if necessary, and penetrate.

Altitude assignments under lost comm are relatively well understood by most pilots. They can get confusing, however, in event of a lost comm missed approach. Remember that three altitudes will be cleared to your alternate for you in event of a missed approach. These are (1) last assigned, (2) minimum enroute, and (3) initial penetration altitude. It does not specify if the initial penetration altitude held open is for your original destination or the alternate. (Cherry Point is 20,000 feet and Seymour Johnson is FL 250). Assume that the altitude held open is for the alternate.

Here's a tip. Approach Control will attempt to clear all altitudes up to FL 250 for you due to the fact that you will probably climb. You may shoot an enroute tacan penetration at your discretion with lost comm if an emergency exists, and low fuel is an emergency. Be sure you know the minimum safe altitude. A good gage to judge your letdown point in miles from your destination is your altitude in thousands plus 10. (At 30,000 feet start the letdown at 40 miles.) Knowing point to point tacan navagation like the back of your hand is a must for this type of approach. You *must* hit the published tacan gate unless you have an emergency and execute the pilot's perogative of noncompliance. You are permitted to shoot an enroute tacan penetration with controlling agency approval anytime, even without radar monitoring.

Since Cherry Point is your primary flying field, know your primary alternates thoroughly. Shoot their approaches and get a look at the fields. A good way to know approximately how much fuel is required to shoot an approach at Cherry Point, missed approach, climb to altitude and a published approach to an alternate, is do it in reverse someday at the end of a hop. Take a note of the time and fuel required. If you know this, you will also know when you will have to shoot an enroute tacan approach. It may save you from an embarrassing situation.—*Hot Dope Sheet*

Stateside Navy and Marine Corps Location Identifiers

Have trouble remembering where you are going or where you have been? End those lapses of memory with this list of location identifiers. Trans-continental types may want to add ELP which is the short title for NAS El Paso.

West		Central		East	
NUW	Whidbey Island	NFB	Grosse Ile	NHZ	Brunswick
NEJ	Seattle	NBU	Glenview	NZW	South Weymouth
NGZ	Alameda	NUU	Olathe	NCO	Quonset
NBJ	Oakland	NQA	Memphis	NSC	New York
NUQ	Moffett	NBG	New Orleans	NEL	Lakehurst
NLC	Lemoore	NSE	Whiting	NJP	Johnsville
NTD	Pt. Mugu	NAS	Pensacola	NXX	Willow Grove
NTB	Los Alamitos	NBE	Dallas	NYG	Quantico MCAS
NID	China Lake	NIR	Chase Field	NHK	Patuxent River
NFL	Fallon	NGP	Corpus Christi	NTU	Oceana
NIY	Litchfield	NQI	Kingsville	NGU	Norfolk
ELC	El Centro			NKT	Cherry Point MCAS
NYL	Yuma MCAAS			NCQ	Atlanta
NTK	Santa Ana MCAF			NBC	Beaufort MCAS
NZJ	El Toro MCAS			NEA	Glynco
NKX	Miramar			NIP	Jacksonville
NZY	North Island			NZC	Cecil
NCV	Brown Field			NRJ	Sanford
				NQX	Key West

TRUTH and CONSEQUENCES

Count Down

"It can be done no sweat—but it'll be close," the pilot had told a prominent civilian aviation admirer. "I can make Desert AFB non-stop from NAS Dixieland. In fact, since it's enroute, I'll probably pass over the old hometown airport when I go and let you know I'm on my way."

The pilot spent about two hours the following morning planning his flight to Desert AFB. In order to meet the IFR fuel reserve criteria, he had to plan the flight in two legs. In this case, NAS Wheatland first, refuel, and then on to Desert AFB. Since his cross-country request had been approved as a two-legged IFR flight to Desert, he had to be letter perfect in flight planning in order to get it past the training officer—who, incidentally happened to have the Ops duty that day. After carefully checking the pilot's route and logs, the Ops duty officer approved the submitted flight plan for the flight to NAS Wheatland and bade the pilot, "have a pleasant trip."

At 1135 local, the A-4 sped down the runway and lifted into the air—on its way. Radio contact was established immediately with Dixieland Departure Control. Within two minutes after takeoff, the pilot directed Departure Control to cancel his IFR since he was experiencing a malfunction of his compass. When offered radar advisory service, the pilot declined stating that, "I'm departing the airways and it won't be necessary—I'm going to circle VFR here a couple of times and check the compass." With this, he changed radio channels and started to proceed VFR to NAS Wheatland.

The *Skyhawk* was next observed visually over the pilot's hometown airfield—which was about 40 miles from NAS Dixieland. After one orbit of the field at an estimated 600-1000 feet altitude and 300-400 knots, the A-4 departed to the northwest, climbing. Since there were 9200 lbs of fuel aboard at takeoff, the pilot was confident that he could afford the 500 lbs necessary for this pass.

An hour and 14 minutes after takeoff, the pilot made his first VFR position report over Texville. Although it is believed that he was at FL 380, he reported FL 250 and then refiled for a VFR flight direct to Desert AFB with an estimate of 2 + 00 enroute and 2 + 30 fuel remaining.

Enroute to Panhandle, the pilot corrected a serious navigation error of 95 nautical miles and 33 degrees of heading. Still it cost him 16 minutes of flight time and an estimated 800 lbs of fuel.

The pilot next reported at Sandstone, 2 hours and 36 minutes after takeoff. Although still believed to be at FL 380, he reported his altitude was 22,500 feet since there was a positive control area ahead of his route. He didn't want to "fool around with" the necessary ATC clearances for penetration. He requested and received the FL 350 and 400 winds from Sandstone. He was not heard from again until his initial contact with Desert AFB tower.

High Altitude—the desert looks smooth; Low altitude—rough

Three hours and 42 minutes after takeoff, initial contact was made with Desert tower. The pilot stated that he was 15 miles south of the field and had the runways in sight. He stated that he had fuel gage problems and would be making a precautionary approach to the field. After receiving landing instructions, it became painfully apparent that he had started his letdown on an airfield short of his destination. He then asked the tower if the tacan was on the air. Desert replied, "negative" and advised that the tacan was down for maintenance. *(NOTAM had been issued on weather sequence reports commencing 4 hours prior to his takeoff and also on the Air Force Notices to Airman System.—Ed.)* He was then given a D/F steer towards Desert.

Three hours and 53 minutes after takeoff, the *Skyhawk* flamed out due to fuel exhaustion. The pilot stated that he had the field in sight but was unable to make it. He then queried the tower for an auxiliary field suitable for a "dead stick landing." Again the tower answered in the negative.

Ejection was accomplished after the pilot decided, at the last minute, that the desert at low altitude isn't as smooth as it appears at high altitude. He abandoned his attempt to belly-it-in and ejected over a small gully at an estimated 180 knots airspeed, 58 degrees right wing down, very slight descent and at 10 feet above the desert terrain. The results were fatal.

He was right—it was close. After flying almost 1400 miles, he missed it by only 17.

Short Snorts

Up, Up and . . . Ah, Uh over

THE PILOT of an A-4 taxied behind a C-130 which was performing engine runup prior to taking the duty runway for takeoff. Propwash plus the natural wind, coupled with a light fuel load and full flap condition of the A-4, was sufficient to tip it onto its starboard wing and shear the nose gear mounting assembly.

The A-4 was scheduled for FMLP and only had 3500 pounds of internal fuel at light-off. Full flaps for takeoff was squadron SOP when aircraft is going to turn immediately downwind into FMLP pattern. External tanks, which would have lessened damage to the starboard slat, were not installed as aircraft was scheduled for daily ordnance missions utilizing wing stations for Aero 7D containers.

Pilot of C-130 was unaware of A-4 about to cross astern and review of tower tape recordings showed no evidence of any transmission on part of the A-4 pilot to inform C-130 of his intentions to taxi behind. Squadron estimated 75 feet separation between tail of C-130 and A-4. Also they estimated the A-4 was caught by 90-degree propwash crosswind of 40 knots.

Inspection

A pilot was just about ready to pull out of the chocks for a test hop following a calendar major inspection. While checking the flight controls he experienced difficulty in elevator movement. At that time the plane captain saw a screwdriver protruding from between the port elevator and port horizontal stabilizer. This infernal tool had been overlooked by everybody in the chain of work.

It got there due to the fact that a screwdriver is normally placed horizontally between the horizontal stabilizer and elevator during maintenance of the flight control system to keep the elevator in place.

The individual performing the work who was responsible for leaving the screwdriver was called away to work on another aircraft and upon returning to the original

job forgot to remove it.

Two master inspectors from the quality control division failed to see the screwdriver during the course of their final inspection.

The plane captain failed to see the screwdriver in the course of his preflight.

The pilot failed to see the screwdriver during his preflight.

Further investigation revealed that the screwdriver was in such a position that any of these people should have discovered it had a proper inspection been conducted.

Stiff Rudder

DURING flight, the rudder controls of an S-2 felt stiff and binding to the pilot. After landing, two screws, one nut and two lockwires were found adrift in the aft fuselage rudder control installation. A no. 6 countersunk machine screw was found wedged in the starboard aft rudder control pulley at station 447.5.

The rudder cable was cut and frayed from contact with the edge of the screw head during rudder operations (see photos).

Nineteen days before, the aircraft had been returned from progressive aircraft rework and acceptance check performed. Inspection of the aft fuselage rudder control installation was not required by the squadron until next calendar inspection.

Squadron recommendation: Don't wait for the calendar.

Control cable cut by screw head

Help or Harm?

DURING post-start flight control and flap check, the pilot of an A-4B actuated ailerons and flaps. The port wing aileron gust lock was still in place and the aileron and flap were damaged.

The airplane was preflighted in preparation for the evening launch. After the preflight check and run-up, it was tied down and duct covers and gust locks put in place.

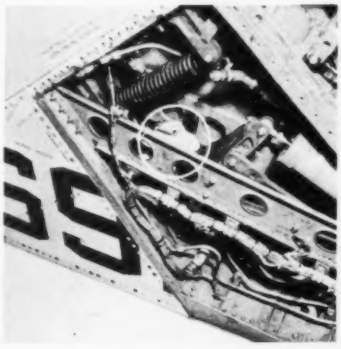
When the pilot arrived, the plane captain and line crew were busy on other aircraft. He made his walk-around and was preparing the plane for flight when the plane captain arrived. The pilot had not removed the gust locks but he got into the cockpit and assumed the plane captain would remove them.

The plane captain had noted that the pilot had removed the duct, tail pipe, pitot tube, angle of attack, and air conditioning duct covers and *assumed* that the pilot had also removed the battens.

During the aileron check when the sound of ripping metal was heard, the plane captain realized that he had assumed wrong—and so did the pilot.

All Screwed Up

DURING post-start checks, the pilot of an F-8 found that forward movement of the unit horizontal tail was restricted to the neutral position. Full nosedown trim only resulted in two units of nose up. Lateral stick movement was normal. The pilot shut down and called for investigation.



Easy to miss

Maintenance personnel discovered a bag of inspection plate retaining screws (see circle in photo) gumming the works.

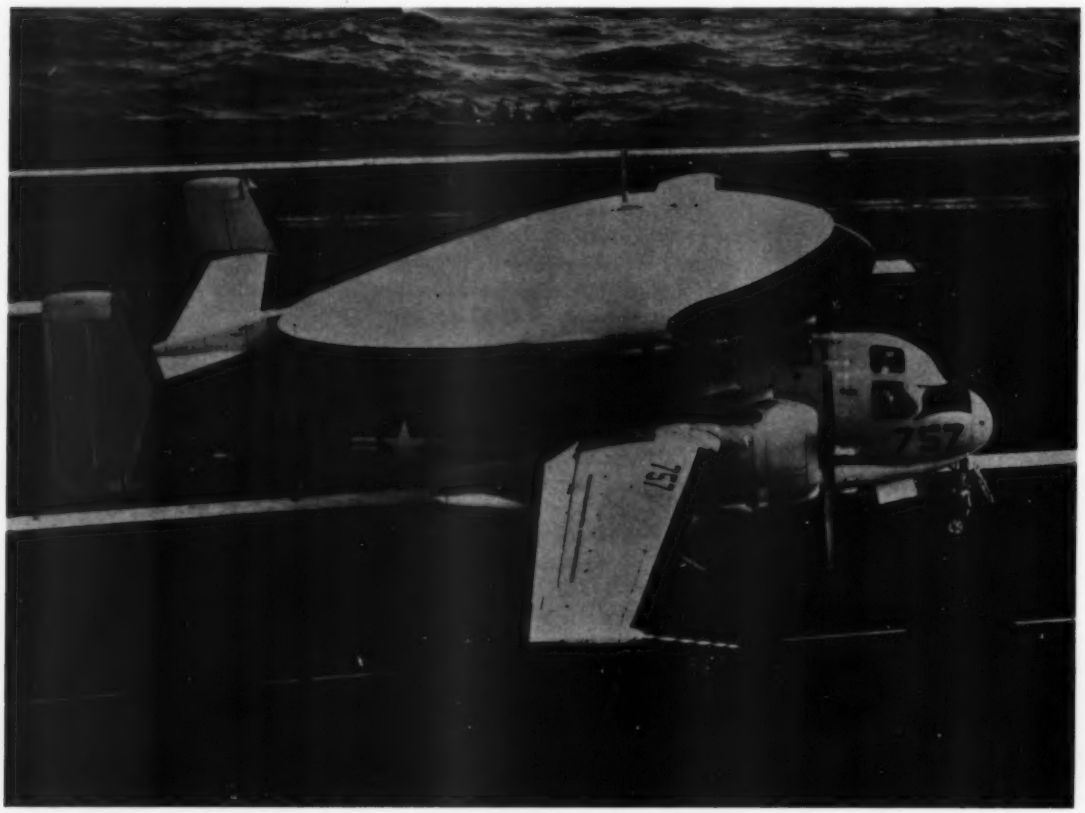
The aircraft had been received from PAR and had flown 8 flights for a total of 11 hours since routine acceptance (inspection plates not removed for this type inspection).

FATIGUE and the Whirling Razor Blades

After a routine training flight, an E-1B made an arrested landing aboard the carrier. The aircraft was taxied forward on the red floodlighted deck and chocked near the forwardmost A-5A.

On signal, the copilot secured the starboard engine. Neither pilot nor copilot had seen any signal to cut the port engine. No taxi director was in sight. Impatient at the delay, the copilot left the aircraft, hard hat in hand, without a flashlight, to see what the trouble was and to signal the pilot to cut the port engine. Proceeding forward and outboard of the port nacelle, apparently checking the port jury strut in place, he continued forward, probably to signal the pilot to secure. As he approached the rotating propeller, he was struck in the face and thrown forward to the deck, seriously injured.

The flight deck director told investigators later that he had given the cut signal for the port engine



when the port strut was in place. Then he had crossed to the starboard side of the plane. The starboard strut was in place so he gave the signal to cut the engine. The engine was shut down and he went to flight deck control to get the brief for the next respot.

What was the copilot's condition at the time of the accident?

He had had a good night's sleep. The morning flight was unexpectedly extended from 3.5 hours to 5.3 hours because of operational commitments. His breakfast was a cinnamon bun and an apple in the readyroom at 0830. He did not get lunch until 1500. With a late lunch, he wasn't hungry for supper so skipped the meal. By the time he landed at 2200, seven hours had passed since he had last eaten.

At the end of the morning flight, the copilot complained of being tired. In fact, the whole crew was tired. The afternoon was spent on paperwork in the squadron readyroom for a message report which was due. He managed to lie down and rest for a half-hour.

Several times during the evening flight he complained to the plane commander of being tired. He relinquished the right seat to another crewmember for 1½ hours, intending to lie down on the floor of the plane and rest. However, he lay down for only about 5 minutes, then had a radar fam session with one of the crew. When the plane landed, he had had 8.8 hours of flight time as copilot in the preceding 13 hours.

In this squadron and especially in patrol squadrons, the flight surgeon states in the MOR, this amount of flight time is not considered excessive or unusual. However, flights of this duration are generally known well in advance and proper preparations (flight lunches, increased allotment of time for sleep and rest, and more equitable scheduling to provide ample time for meals) can be made. Such was not the case here. The long initial flight, extended because of operational commitments, came as a surprise to the crew.

Following a night landing, the flight surgeon says, it is a normal and expected reaction for an individual, now that he's back home, to experience a letdown. Giving in to fatigue somewhat, he loses his sharp edge. When the copilot encountered a seemingly needless delay, he abandoned caution and left the aircraft to investigate.

What about the taxi director? The AAR analysis states, "The flight deck director's duties concerning shutdown and securing engines are not adequately defined in the ship's instructions. No provision is made for the occasional missed signal such as occurred in this accident." The MOR says that apparently the taxi director gave the cut signal for the port engine while the pilots were performing the post-landing and secure checklist. Neither pilot saw the signal. After what seemed like a proper wait, a cut signal for the starboard engine was given and the pilot secured it. The taxi director left the area. Had the taxi director obtained pilot acknowledgement of his port engine cut signal and remained until the pilot complied, the accident would have never occurred.

Another plane captain, also wondering about the delay in securing the port engine, went around in front of the aircraft to give the cut signal to the pilot. He was trying to give the signal as the copilot was struck by the propeller. The flight surgeon who had just debarked from the aircraft brought immediate medical aid and summoned medical aid from the ship.

Fatigue was considered a primary cause factor in this accident. Mental alertness, at least partly, varies with degree of fatigue and physical comfort, the AAR states. The copilot's sharp edge of mental acuity was dulled by the following specific factors:

- Physical discomfort accumulated during 8.8 hours of flight time.
- Inadequate food intake.
- Normal impatience with an unexplained delay in securing the port engine.
- Normal and expected letdown experienced at the completion of a night carrier operation.

"When unexpected operational commitments arise and flights are extended aircrew fatigue is going to become more prevalent," the AAR continues. "Supervisory personnel, specifically commanding officers, officers-in-charge, and operations officers, should recognize this possibility and be increasingly attentive to the physical and mental condition of flight crews. There should be no hesitancy on their part to alter flight schedules and/or juggle flight crews. Conversely, the individuals affected, who are normally hesitant to request temporary grounding, should overcome this reluctance. Only to this extent supervisory factors may have contributed to this accident. The board feels it is a command responsibility to remain aware at all times of the physical conditions and degree of fatigue present among flight personnel but an equal responsibility is shared by individual crewmembers to make known instances of excessive fatigue."

FIELD FAMILIARITY

It was a clear, warm night with a full moon and a light wind. Perfect conditions for a proficiency type to get in some more night time and the required four for pay. A white hat of the unit had requested to accompany the pilot on this flight, but was unable to make the takeoff time so arrangements were made to pick him up later. The TC-45J was fired up with a member of the local line crew in the right seat. An uneventful takeoff from runway 31 was made about 30 minutes after sunset as the moon was rising. After takeoff the tower broadcast in the blind that the duty had been switched to runway six.

Forty-five minutes later, while cruising in the local area, clearance was obtained from the tower to make a passenger stop even though there were FMLPs in progress. The landing was uneventful and the line crewman vacated the aircraft when another white hat from the pilot's unit replaced him. After a ditch and bailout brief, clearance was received to taxi to the approach end. At the approach end the *Beech* was cleared into position to hold. The pilot taxied out and lined up with the runway lights and landing mirror lights to port.

The stage was now set for the cause of this Anymouse report. Clearance for takeoff was passed by the tower, acknowledged, and the takeoff commenced. The tail wheel lifted normally and at this point something seemed to be wrong. With the nose down and better visibility up forward the usual dual row of runway lights were missing. Only one row was observed and it was to port. At

ANYMOUSE

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in ready-rooms and line shacks. All reports are considered for appropriate action.

— REPORT AN INCIDENT, PREVENT AN ACCIDENT —

the same time the *Beech* began to bounce as though traveling over an unprepared surface. A rapid scan of the instruments disclosed that airspeed was passing 60 knots so the pilot elected to complete the takeoff rather than abort, since the condition of the terrain ahead was not known.

After becoming airborne and cleaning up the aircraft the tower was notified, the gear dropped normally and a low pass was made to check for any possible damage. No damage was detected, the crash crew was requested and a normal landing was made without the use of brakes. The aircraft was brought to a gradual stop on the runway and the crash crew inspected the gear. A thumbs-up was received from the crash crew and the aircraft taxied back to the line.

This NAS has landing mirror systems set up on every runway. On every runway except the one in use on this occasion, the mirror is on the port side. Runway 6 has the mirror on the starboard side. The pilot has flown out of this NAS for 11 months on a proficiency basis, but had never made a takeoff from runway 6, day or night. Landing lights were not used for the takeoff out of consideration for the aircraft in the FMLP pattern. This runway has a large apron on the starboard side of the approach end which was used for this takeoff in conjunction with 35 yards of unprepared field area.

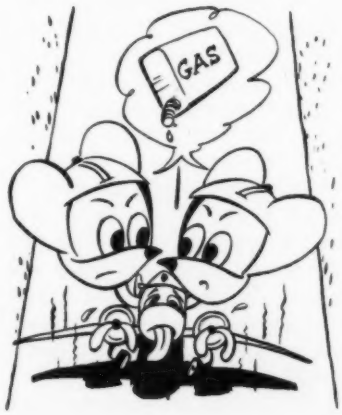
Fuel Checks

Two pilots recently qualified in the TC-45J departed on a local flight. High work was performed during the first portion of the flight and both auxiliary tanks were burned down to 2/10 full. The right main tank was selected and a descent made to join the touch-and-go pattern for several practice landings.

Halfway through the bounce period the pilot in the right seat switched the fuel tank indicator gage to the left main tank which correctly indicated FULL. He then asked the pilot in the left seat to switch the fuel tank selector to the left main position. The pilot in the left seat complied but while rotating the selector switch his attention was diverted and he accidentally selected the left auxiliary tank which now contained less than six gallons. No fuel report was given and neither pilot noticed the mistake.

Four touch-and-go's later, as takeoff power was being applied, both engines quit. The takeoff was aborted and two surprised pilots learned the terrible truth.

Standard procedure in the TC-45J requires a voice report of either "Left Main." "Left Main, ... tenths remaining" or "Number 1." "Number 1, ... tenths remaining," any time a new fuel tank is selected. This procedure will insure that an empty tank has not been selected and that a positive flow of fuel is obtained.



Finger Lickin' Good

WHILE ENROUTE to the operating area for an early morning ASW exercise, a crewmember of our P-2 was using his time well by repairing a balky trailing wire antenna reel. The long, bare copper wire antenna was coated with the usual green and rusty-colored corrosion which in the process got all over the technician's hands.

With the job finished and yet another hour's flight ahead before on-station time, he decided that a few minutes of study would be relaxing. Thumbing through the pages of his book and *giving his fingers an occasional lick* to help in turning the pages, our unsuspecting crewman ingested a small amount of the nearly invisible copper oxide, and within a few minutes sharp stomach pains warned him of trouble. Stomach pains quickly turned to a flushed feeling and burning sensations of the head and stomach. Water, lots of it, did not help. Wait a few minutes and maybe it will go away.

By now the exercise with the submarine had begun, but a call on the ICS to the pilot was in order; something had to be done to relieve his distress. The exercises continued while efforts were begun to induce vomiting, to get rid of the problem. Even sticking his finger down his throat would not work. Soon the submarine was on the surface again after the end of the exercise, and its hospital corpsman was called to the radio to render whatever assistance he could. The P-2's navigator made mental note of the heading and distance to the nearest airfield, some 150 miles away in a foreign port.

With a quick description of the symptoms and the suspected cause

over the air, the sub's corpsman asked first, "Do you have any medical personnel on board?" "No, we are all amateurs."

"Is there any mustard on board? And do you have any warm water?" By this time the whole nine-man crew was listening to the exchange over UHF.

"Affirmative," was the reply. Inflight rations always come equipped with mustard for the usual sandwiches, and the water breakers were full. Following directions over UHF the crew accumulated plenty of mustard and warmed some water to administer to induce vomiting. Meanwhile, the submarine's corpsman further advised that whether or not the troublesome matter could be regurgitated, our man should have the attention of a doctor. Even as the "Roger out" was being passed the P-2 began its turn toward the nearest field.

"It will take about 30 minutes to get to medical assistance; is there anything else we can do enroute?" The startling reply: "If breathing should stop lay the victim flat and administer artificial respiration." While we could not imagine that the man's condition could worsen quite to that degree, I think every man listening to the exchange over the radios mentally reviewed his procedures for mouth-to-mouth resuscitation and the use of oxygen which was available.

Within a few minutes after the jets had gone to cruise power and the P-2 had accelerated to 250 knots and climbed to 3500 feet, the corpsman's remedy worked, and our man was considerably relieved though certainly not fit as a fiddle yet. Even before landfall, contact was gained with the airfield's Approach Control. Through somewhat of a language barrier—the controller was not speaking his native tongue nor was he hearing an entirely familiar aviation vocabulary in this transmission—we gained clearance into the control zone and made our need for medical assistance on arrival understood.

The landing and taxi clearance were graciously expedited by the tower operator. Stepping out of the aircraft the sick man and the aircraft commander were met by a medical officer of the Spanish Air Force. He was made to understand that sure enough we had a sick man on our hands, but high school Spanish wasn't adequate to describe the nature of the copper poisoning. Maybe writing down the universal chemical symbols for copper oxide (CuO) would get it across. No comprendo. But in a few minutes another Spanish officer came along to interpret for us while the poor technician's distress was still gnawing at his system.

The airfield ambulance whisked us to the lounge of the local Spanish officer's club where a common antidote of powdered charcoal suspended in water was administered. It was obviously not very tasty, but it seemed to do the job. After sincere thanks for timely assistance were rendered to our Spanish friends, we cranked up and returned to home base while the object of all our worries slept much more comfortably in the after-station.

Flight gloves need not be held ready just for emergencies and for landings and takeoffs. They do a good job keeping your hands clean, too.

Look Out—Here I Come

I presume most military pilots are impressed with the speed with which departures and arrivals are handled at large commercial airports. In fact it wouldn't surprise me to hear military pilots sputter and fume while awaiting for departure at a military field due to seemingly unnecessary separation between departures and arrivals. "You wouldn't see this much sitting and waiting at a civilian airport," might be the gripe. "These guys won't release you unless the traffic is 10 miles out on final."

Fellow pilots, let me give you some assurance that these delays are largely justified and may some day save your hide. Recently I had occasion to make a passenger stop at a major civil airport. On departure, at night we taxied to the runup mat adjacent to the active, made our runup, received clearance, and were ready to go. Traffic was landing at the rate of about every 45 seconds to a minute.

Following landing of one of these inbounds we were cleared to take position and hold. We promptly started out on the duty and when about halfway to the centerline the tower casually said, "Coast Guard . . . clear the runway!" We looked to the right, in the direction of incoming traffic, and leapin' lizards, Annie, there were a pair of landing lights about a half-mile out coming on fast. There just wasn't time to do a 180 and clear the area, and nothing but boondocks straight ahead, so we did the only thing we could: reverse on all four and back up blindly onto the run-up pad. Thank The Lord we had a turbo-prop aircraft with lots of poop in reverse. As it turned out we cleared the runway in the nick of time—the wing tip of a Boeing 707 went across the top of the cockpit as we cleared the runway.

As we were starting engines on the ramp prior to taxiing for this flight we had noted four to six aircraft, nose to tail, waiting to take the duty and commented that we could probably expect a delay. Fortunately, when we reversed, without being able to visually clear ourselves during the above incident, there were no aircraft waiting behind us to follow us onto the runway.

Look before you take position, even well experienced controllers can have a bad day.

Rough Rider

Our flight of A-4Bs was cleared to land immediately after an F-8 had taken off using afterburner.

On rollout at 100 knots I experienced a sudden, loud and violent vibration. I thought the engine had come loose or the bearings had failed. After asking the tower for assistance, I shut down on the runway. A quick perusal of the craft showed nose wheel without a tire.

Unbeknownst to me, the F-8's takeoff blast had torn a hole in the runway two feet long, six inches deep, and six inches wide. On rollout my nosewheel had hit this hole. Surprisingly, directional control was no problem during the remaining rollout.

Light Illusions

While flying as copilot of an SH-3A, we were directed by the controlling carrier to hold on a radial, no higher than 300 feet and at 5 miles. The ship was conducting night carquals for fixed wing aircraft and the sky was very black.

The pilot was at the controls and I was looking out into the dark night. I observed a green and red light directly ahead of us. Suddenly the lights began to spread apart very rapidly. I could just picture a midair with some fast moving S-2 which would have spoiled my leave period.

I grabbed the controls and pushed the collective down, shouting, "I have it!" The pilot became a bit concerned since we were only at 300 feet and falling like a rock. I leveled off at 100 feet and waited for the sight of a two-engine airplane to go flashing overhead—nothing—no more lights.

I explained to the pilot who had been on instruments what had happened. We climbed back to 300 feet and proceeded outbound.

On our return to the inbound leg, the moon poked through the clouds and directly in front of us were two destroyers facing us at such an angle that the starboard running light of one and the port running light of the other were the only lights visible; and, as we approached them, the lights once again started to spread.

How Has APPROACH Helped You?

APPROACH would like to know the details if information in the publication has aided you in performing your job or helped to prevent an accident or incident.

Please take a moment to write a short informal note citing your example.

Send it to: APPROACH Editor, NASC, NAS Norfolk, Va.

Reader Questions Headmouse Answers

Have you a question? Send it to Headmouse, U. S. Naval Aviation Safety Center, Norfolk, Virginia 23511. He'll do his best to get you and other readers the answer.

CSD Servicing

Dear Headmouse:

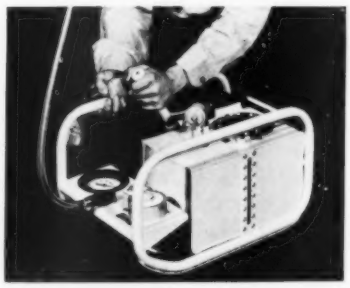
"Oil Servicing" (APPROACH July 1964) was truly a wonderful article and should be required reading for all personnel concerned. Being the nitpickers that we are, we just have to bring up a couple of things:

1. If the picture on page 33 isn't upside down then the oil coming out of the overflow drain line is going against all laws of gravity.

2. Why all the emphasis on having a clean oil service cart with good filters to assure good clean oil to CSD and yet on page 34 the picture showing the priming of a CSD, the oil is being poured from an oil can? Our squadron uses a *clean, properly serviced* PON-6 to accomplish this.

H. W. STOKES, AMCS
F. O. TRAVIS, ADJC
VF-142 NITPICKERS

▶ Gents, you're right in both cases. *We* goofed! Regarding the latter point, BuWeps Inst 10350.1A of 3 April 1963 states: Mil-L-7808 synthetic oil for turbine engines is supplied in sealed one-quart or one-gallon metal cans. Although this type container was chosen to minimize contamination, it has been found necessary to filter the oil to remove metal slivers, can sealants, . . . , which may occur as a result of



PON 6

opening the can. Mil-L-7808 oil should be dispensed to aircraft only through a preoiler or dispensing unit equipped with a 10-micron or finer filter element. Suitable units are the Preoiler and Pressure Filling Unit, Stock nos. 4930-654-9071-S030, R4920-645-4071-S030, the PON 5-75 and PON 6.

Very resp'y,

Headmouse

Unlike the flight control systems on present day high performance aircraft—the Naval Aviation Safety Center desires a continued feedback.

Has information in any Safety Center publication ever helped you to prevent an accident, avert an injury, or deal with an emergency in a better way?

If so, and you have not already informed the Safety Center, it is particularly desired and important that you do so. Such feedback is vital to all departments at the Center and for fiscal support of our safety research and education program.

Instruction Info

Dear Headmouse:

Is there an instruction stating aircraft not fully fueled are not to be stored in hangars for repairs?

Is there an instruction prohibiting the towing of aircraft during thunderstorm conditions with lightning in the area?

ANYMOUSE

▶ Yes. OpNav 34P-1, U. S. Navy Safety Precautions, Para. 03206 Aircraft Fuels, sub para 3.4: "Aircraft fuel tanks shall be *filled, purged,* or *have an inert gas* (such as CO_2) over the gas in the tanks before storing airplanes in hangars, since this leaves no space for explosive vapors to form."

Para 03207, Fueling procedures, sub para 4.h.: "Tanks of stored airplanes to be full. Fuel tanks of planes will normally be filled before the planes are placed in the hangar or any closed storage. Full tanks, with provision for expan-

sion, are considered less of explosive hazard than tanks that are partially empty."

You are reminded that this OpNav is undergoing revision and was dropped from fleet usage 1 July 1964—see page 47 July '64 APPROACH.

Research here has failed to uncover an instruction that is pertinent to your second question. However, there is an instruction related more to your first question. NavAer 06-5-502 "Handbook on Aircraft Refueling" Chapter IV, Para 4, sub para 15 m. states, "Discontinue fuel handling operations during severe electrical storms."

Very resp'y,

Headmouse

Adjustable Nape Strap

Dear Headmouse:

What is the Safety Center's opinion of adding an adjustable nape strap to APH-5 and APH-6 helmets? It might provide more effective helmet retention during ejections and bailouts and also make helmet donning easier.

ANYMOUSE

▶ From past experience it has been found that an adjustable nape strap has inherent drawbacks which cannot easily be solved: 1) The advantage of ease of donning was far outweighed by the number of cases in which the wearer did not tighten the strap. There was also the complaint of "another strap to pull on." 2) Though individual improvements to the helmet may weigh only ounces, the total weight adds up. The prototype APH-5 has had a weight growth factor of *almost* 75%. 3) It is felt that the pilot who has a loose nape strap now will also be found flying with a loose adjustable nape strap.

Very resp'y,

Headmouse

Wants Flight Deck Safety Shoes

Dear Headmouse:

Regarding recent APPROACH and *Weekly Summary* items on wearing steel toed safety shoes on the flight deck, the only safety shoe that we have knowledge of is the steel toed safety shoe designed for use in magazine areas below decks and on shore stations. This shoe does not have a flight deck sole and it becomes very slippery after coming in contact with oil, grease or fuel spilled on the deck. I and many of our flight deck personnel feel this disadvantage outweighs the advantages of wearing this shoe. I am sure that you at the Safety Center are aware of the dangers of wearing other than flight deck soles on the flight deck.

I am very much in favor of wearing a safety shoe on the flight deck. However, I strongly feel that this is not the shoe for the job. If there is another shoe which we have not heard about, we would very much appreciate any information we could use in acquiring this shoe for our flight deck personnel.

LTJG J. W. BAKER
VA-65 MAINT. SAFETY OFFICER

▶ The Chief of Naval Operations has directed the Bureau of Supplies and Accounts to explore the feasibility of modifying shoes manufactured under Mil-S-21894 (Flight deck shoe, non-slip tread outersoles and heels) to provide the necessary foot and toe protection. As an interim fix, one carrier is gluing slip resistant halfsoles and heels onto steel-toed safety shoes.

Very resp'y,

Headmouse

Magnetic Chip Detector

Dear Headmouse:

One of these days the arrangement of the magnetic chip detector in the S-2 is going to result in the wrong engine being caged. Why not place the lights horizontally?

ANYMOUSE

▶ This item is the subject of an Aircraft Service Change which is effective in new production S-2Es commencing with BuNo. 151646. It will be retrofitted on all S-2/E-1/C-1 aircraft.

Very resp'y,

Headmouse

". . . But if we're getting better reliability how come they keep working on better ejection seats?"

Weather you

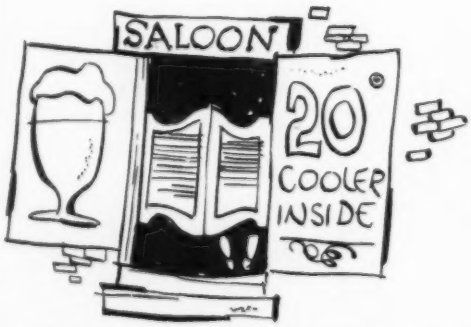
STANDARD ATMOSPHERE
Air supplied free of charge to customers of Standard Oil Company

THUNDER HEAD
Mother-in-law

BUFFETING
Eating dinner while standing up

JET STREAM Jet with a leaky fuel tank

WINDS ALOFT A talkative copilot



ISOBAR An airconditioned saloon

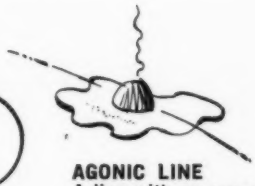
MECHANICAL TURBULENCE
An upset mech

CUMULO-SECURUS
We don't go

u like it or not...

Adapted in part from Aviation Mechanics Bulletin

ROTOR CLOUD Helo weather



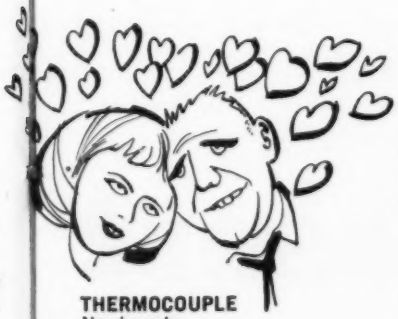
AGONIC LINE
A line with an egg on it, what else?

STABLE AIR
An atmosphere tinged with the odor of fertilizer

OTROPIC A cool drink in Panama

FORECAST
An educated guess by a licensed fortune teller

TERMINAL VELOCITY
Speed limit at the airport

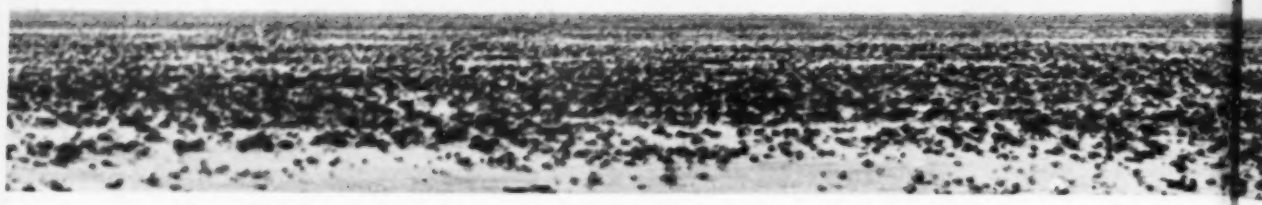


THERMOCOUPLE
Newlyweds

METEOROLOGIST Licensed fortuneteller

TERMINAL FORECAST
Requires small crystal ball

AREA FORECAST
Same forecast only bigger; requires larger crystal ball



On Wheelus Air Base (North Africa) there stands a monument—a bent propeller which serves as a constant reminder that desert survival training is important. It is one of the propellers from the *Lady Be Good*.

The *Lady*, a B-24, was last heard from in 1943 while returning from a mission. She was found in 1959, and a year later the bodies of eight crewmembers were located. The aircraft had overflown its base and wandered, lost over the desert until fuel was exhausted. The crew bailed out prior to the crash. All eight apparently survived the landing—but none survived the desert! Every one of them died from exposure and lack of water, though rations and water were found in the aircraft wreckage, still usable after all these years.

What is the desert like? At Wheelus one need but step outside to find the answer to that question. It's hot and dry, it's sparsely inhabited and even more sparsely vegetated. Some of it is mountainous, and some of it is sandy. However, if we think of sandiness as a prerequisite of a desert, the Sahara hardly qualifies because its surface is about 90 percent gravel.

You might define a desert as a non-ideal site for terminating a flight, though bailout or crash landings don't usually permit much choice. And since deserts cover one-fifth of the world's land surface, perhaps we should know more about them. If forced down, what can you expect, and what can you do to survive?

DAYS OF EXPECTED SURVIVAL IN THE DESERT

UNDER TWO CONDITIONS

Condition	Max daily shade Temp °F	Available water per man, U. S. quarts					
		0	1	2	4	10	20
No walking at all	120	2	2	2	2.5	3	4.5
	110	3	3	3.5	4	5	7
	100	5	5.5	6	7	9.5	13.5
	90	7	8	9	10.5	15	23
	80	9	10	11	13	19	29
	70	10	11	12	14	20.5	32
	60	10	11	12	14	21	32
	50	10	11	12	14.5	21	32
Walking at night until exhausted and resting thereafter	120	1	2	2	2.5	3	
	110	2	2	2.5	3	3.5	
	100	3	3.5	3.5	4.5	5.5	
	90	5	5.5	5.5	6.5	8	
	80	7	7.5	8	9.5	11.5	
	70	7.5	8	9	10.5	13.5	
	60	8	8.5	9	11	14	
	50	8	8.5	9	11	14	

Desert

I've already mentioned that a desert is dry. It follows then that the greatest problem in desert survival is water. How long do you think you could last with no water? With one quart? Four quarts? Take a look at the chart and remember—summer daytime temperatures can reach 125°. Air Force Manual 64-5 says "in hot deserts, you need a minimum of

a gallon of water per day." With this gallon, you can travel up to 10 miles in the daytime or 20 at night.

The next question: where is the water? The first place to check is your airplane. If you are lucky, the jugs or jerry cans will still be intact. If not, your chances of finding a good supply are slim. There are still some possibilities, however.

If you are near an oasis, your water problem may be solved early. Oases are low spots, usually characterized by vegetation. And, there is usually water. Some of them have deep wells, so you will probably need a rope and container to obtain water. Parachute lines can be used if you thought to salvage them. Remember though, that oases are few and far between.

If you are near the coast, fresh water can sometimes be found in the dunes above the beach or even

Survival

under the surface of the beach itself. Look in the hollows between dunes for water which may have collected there. If you don't find it there, dig down on the leeward side of the first dune or any place where the sand appears moist. The first water you encounter will probably be fresh. If you dig too deep you may strike salt water—which you must not drink. Scoop a small hole and let the moisture collect.

If you are inland, look for dry river beds. Even they will often produce water. Dig down below the concave bank on the outside of a curve or bend. Again, allow the water to collect by scooping small holes. A remote possibility is to find an old caravan camping area, which may yield a well. Look for it to be covered carefully to protect it from drifting sand. Be careful not to knock loose sand into the well for there usually is only a shallow pool at the bottom.

Another source of water is dew which can be collected early in the morning. Rocks and metals may yield enough moisture to collect in a container, or you can sop up the dew with a piece of cloth and then wring it out. (Note: grease and dust do not improve the taste.)

In American deserts, several types of cactus may be used as a water supply. No matter how you collect or find water, remember this: drink it as you need it.

Getting water is only half the battle—now you must make it last by conserving sweat. Your body gets rid of heat through evaporation of perspiration. As the body water level drops, sweating is reduced, body temperature goes up, and your efficiency is cut drastically. An increase of 6 to 8° from your normal temperature is fatal. Although you may feel cooler with your clothes off, you are losing water rapidly. Being fully clothed keeps the heat out,

and slows evaporation. The main points to remember: drink water, save sweat, don't dehydrate.

Exposure to sun and heat is one of the desert's greatest hazards. The daytime highs of 125° have already been mentioned. Exposure to such extreme temperatures can cause heat cramps, heat exhaustion or heat stroke. The desert sun can complicate this with sunburn (even on well-tanned individuals) or sunblindness or both. To guard against these keep your body thoroughly covered. Wear loose, light-colored clothing if possible, using parts of parachutes if available. Be sure to keep your head and neck covered; an Arab style headdress will serve well for this purpose. And don't be shy about using the pilot chute as a parasol. If the darker-skinned nomads have to protect themselves from the sun by being fully clothed, you'll need everything you can find.

Shade is another important factor in reducing exposure. Use the wing of the aircraft, with a parachute or any other cloth as an awning. Be sure to leave two feet of open space below the canopy for air circulation. Stay out of the aircraft itself until the sun goes down—the fuselage acts just like an oven. Other shade sources are rock ledges, caves and the walls of stream beds. A covered trench will also provide shade, but remember to leave some space for air circulation.

Hot surface temperatures can be another minus factor. Twelve inches above the ground the temperature can be 30° cooler. When lying down or sitting use anything you can find, such as an inflated life raft, as a spacer between your body and the hot surface.

Food is always a problem. First check the aircraft and any survival kits for food packages. Ration what you find and then start looking around.

Although birds and animals are scarce in areas with little water or vegetation, some may be found. Small burrowing animals come out at dawn or dusk, and can be caught in snares. If you see birds, try making squealing sounds on the back of your hand to attract them close enough to use snares or clubs.

Meat will normally provide more nourishment than vegetable materials. However, vegetation may be the only source of food available. Some areas have edible wild tulips or onions. The same cactus which provide water also have food value. Since vegetation varies widely, check your *Survival Training Manual* (NavAer 00-80T-56) and your local survival training experts for advice on areas you may fly over.

One of the most irritating problems on the desert is insects. Flies and sand fleas will be quite bothersome. Likewise mosquitoes which may also carry malaria. Spiders and scorpions can add to the hazard. And in some areas there are small snakes called vipers which may be poisonous. Good body cover, plus a carefully cleared camp area will help control these pests.

Still another important phase of desert survival is obtaining help from others. If you can contact any of the nomads who live on the desert, your chances of survival will be greatly increased. Generally their sense of hospitality is very strong, and they will provide you with water, food and shelter. Remember that they are extremely religious people and often deal promptly with offenders. So be prepared to respect their customs, lest you wear out your welcome.

Another type of help is Air Rescue Service, which stands ready to help at all times. When there is the slightest possibility of bailout or crash landing, notify them immediately. Once on the ground, try to do the same. If the aircraft radios are still working, put out a distress call on 8364 kcs (HF), 121.5 or 243 mcs (VHF/UHF). If you have a "Gibson Girl," transmit during the 15-18 and 45-48 past-the-hour periods. And don't forget the antenna counterpoise, unless you can ground the set in damp soil.

For visual sighting, a bright flame works best at night. Smoke or mirror signals are effective during the daytime. A tin can filled with sand and gasoline makes a fine flare—add oil and bits of rubber for daytime smoke. You might also lay out parachute panels or dig shadow trenches. A point that cannot be overstressed is *stay near the aircraft.* The only exception is if you know you can reach help and if you're certain you have enough water to make it.

Once Rescue finds you, they will make every attempt to evacuate you or keep you supplied until help arrives. However, try not to collapse at this point, for you can help them help you.

These are only a few of the many proven ideas for desert survival. More will be found in your training manuals. Remember, *you* are the key to survival; you must be ready to solve the problems of water and exposure and cope with the many other hazards.

Though desert survival is difficult, it is by no means impossible. How many of the *Lady's* crew do you suppose would have lived—if they had been prepared?

—The MATS Flyer

Hairy Ride

FOLLOWING mechanical failure in a T-33B, the pilot ejected in a 45-degree dive, airspeed about 450 knots and 11,000 feet the last altitude noted on the altimeter. Parachute opening and descent were hairy. . . .

"The zero delay lanyard was connected and when I pulled that trigger the seat went out and the chute opened instantaneously. The leg straps of the harness were good and tight but *the chest straps were not as tight as they should have been.* When the chute opened, it jerked up short and the risers pulled the shoulder straps and peeled them back over my shoulders. This put me in a nose down attitude in what was left of the harness. My feet were pointed not straight out behind but sort of down. My head was down about level with or slightly below my feet. I was in pretty poor shape as far as moving around at that time. . . .

"I was not getting oxygen from the bailout bottle so I reached down and tried to pull it. I pulled as hard as I could but nothing happened. (*The bailout oxygen bottle hose had broken. Ed.*) Realizing I couldn't get any oxygen from the bottle, I loosened one bayonet fitting on the mask, swung the mask to one side and started breathing normally.

"I began to realize, descending as I was, that it was going to be a rough landing. I managed to get myself upright in the harness —no easy chore because my arms were almost immobile—but I got up and locked my arms around the risers. At this time things began to change from green to gold. I was starting to black out, not completely, but everything was in technicolor. Started breathing hard to increase the pressure in my lungs.

"During the descent I didn't have the strength to get myself back into the sling. Tried to lock my hands to stay upright rather than flip back into the position I was in before. At least one shroudline was broken. I saw a tattered end that was hanging nearby. I looked up into the chute—it seemed awful small. Getting down took forever but as time went by I saw the ground coming up. Things were turning greener and golder, blobs floating around. I was heading for a road—no control over the chute. My arms were too beat up to do anything with it so just had to go wherever it was going to take me.

"I just cleared some roadside power lines, barely cleared the road, and landed next to a guard fence and sort of bounced off. There was little wind blowing so fortunately the chute collapsed and I wasn't dragged."

The moral here is obvious—cinch up your chute harness tight. Had this pilot ejected over water we might not have his survival narrative to read.

Photo shows what happens when the chest snap is too low.

ALL PILOTS READ

Effective Supervision

Many directives have been written and much effort at all levels of endeavor by those associated with military aviation has been expended whether in R&D, test and evaluation, or operational usage of airplanes and their associated equipment. Safety has always been a paramount consideration by all concerned.

Through the past years a steady reduction in the number of accidents/incidents in relation to flight hours has been accomplished. It is undoubtedly possible to continue this trend. It is my opinion that all of us have been provided sufficient guidance in the form of directives, limits, schools, training devices, and restrictions to accomplish our mission.

We must acknowledge two basic facts; humans can fail and machines can fail. Failures can be the result of many things. We can reduce the number of failures if we concentrate on instilling personal and individual pride in every human at all levels. Each of us in any supervisory capacity must do our very best job and feel proud with the knowledge it has been done so. We must have and we must develop in others this individual interest, industry and pride if our existing regulations, limits, advisories and restrictions concerning safety are to be worthwhile.

A successful humanities program will assuredly result in fewer human and machine failures thereby contributing materially to a low aviation accident/incident rate. As an aside rake-off, disciplinary problems will wane.—*Chief of Staff ComFAirJapan*

CLIVE & RODNEY *(the last of a series)*

SORRY, CHAPS; MAINTENANCE SHED-U-AL WAS BOTCHED

Let There Be Light

Visibility at dusk or dawn is rather difficult, and so it is surprising to note the number of pilots who do not extend and illuminate their landing lights during descent, or who switch off and retract them immediately after takeoff.

We are reminded of the parable of the blind man who always carried a lighted lantern during dusk, night and dawn. When asked why a blind man should carry a lantern, he replied, "So that others will not fall over me."

The lesson: The obvious wisdom of displaying landing lights in the vicinity of an airport, during descent and ascent, at dusk, dark and dawn.

—*American Airline Flight Deck*

Your Safety depends on:

1. What you think about it.
2. What you know about it.
3. What you do about it:

Can-Do Boo Boo?

I can-do attitude and desire to perform the job expeditiously, though commendable in its place can, as in this case, lead personnel to deviate from the procedures and regulations set up to preclude this type of accident. Supervisory personnel must be doubly alert when the tempo of operations increases to prevent short cuts being taken at the expense of an effective ground safety program. — *From the endorsement to an accident report*

The Copilot

The copilot has many duties in a naval aircraft. He is part of the team and the success of the ASW mission depends to a large intent on his efficiency. He is also learning, so he will be able in time to assume the duties of crew commander.

One of his more important duties, although it may not be laid down in a squadron doctrine, is to act as a safety pilot. In the performance of certain tactical maneuvers it is quite possible for the pilot to get into a dangerous position, e.g., he can be so concerned with maintaining an accurate course that he forgets to watch his altitude. The copilot should be prepared to either advise the pilot of the situation or if necessary take control.

It should be obvious that this procedure must be agreed to beforehand between the pilot and copilot. Also the copilot must be told exactly what the captain expects. There is no use in the captain saying "tell me if I get too low"; *rather he should say as example "warn me if I get below 150 feet or if I go over 45 degrees of bank."* (Italics supplied—Ed.)

Squadrons could well consider including this procedure on their operational doctrine. Let's keep out of trouble by employing *all* the talent in the aircraft.

—*"Waveoff"*

Account for all Hardware.

Beware all Safety Pins.

Count your Tools.

... and to protect yourself——
Wear tight clothing.

Fire Training Technique

The following quote is taken from a reported discussion between an ALPA Safety Representative and the Chief of a small Fire Department:

"We also discussed training procedures, especially regarding the use of foam. The Chief pointed out that training with foam would have been limited because of cost considerations. However, they tried a dishwashing detergent and found that it handled much like the standard foam. They tried the detergent suds on oil and gasoline fire drills and found it to do almost as good a job as the foam. In fact, the difference was surprisingly small."

Ed. Note: Perhaps this technique should be further evaluated.

—*ALPA "Tech Talk"*

How Did You Cope With the Problem?

Questionnaires on APPROACH magazine are handed out by NASC personnel on their visits to squadrons and air stations.

One of the most frequent comments is similar to this one from an instructor at Pensacola. "I would like to read about some of the pilots and crews who coped with various problems and solved them in a professional manner. I know that these are printed from time to time, but I believe that if a few of these were included monthly they would be received well."

We of APPROACH agree—but we can't print what we don't receive. So grab the nearest Anymouse form or stationery and report your experience—past, present, and future.

Changes to NATOPS Manuals

An analysis of aircraft mishap reports indicates that confusion exists among operators as to the correct method for submitting requests or recommendations for changes to NATOPS Manuals.

OpNavInst 3750.6E specifically requires comment, whether or not recommendations for changes to NATOPS have been proposed in cases where an aircraft mishap indicates possible need for such change.

OpNavInst 3510.9B outlines procedures for submitting these recommendations.

NASC does not govern nor does it coordinate changes to a NATOPS Manual. Instead it monitors proposals and recommendations for safety of flight criteria. NATOPS recommendations included in aircraft accident reports do not constitute a valid request for such changes. *It remains the individual responsibility of the activity submitting the recommendations to initiate separate correspondence in accordance with the provisions of OpNavInst 3510.9B.*

Post Midair

After the midair collision, ejection was my only thought. I moved my right hand from the stick to the alternate ejection handle and pulled. Altitude was about 20,000 ft. My decision to go was rapid—my feet were on the rudder pedals but my head was not against the head rest.

The next instant I was free-falling in a spread eagle position in complete darkness. There had been no acceleration or G-forces—it was easier than any training shot I'd ever had. Wind blast was very slight—didn't even lose my gloves.

The free fall seemed to take forever. I began to wonder if the automatic parachute opening device was going to work. After several seconds, I gave the manual D-ring a pull. It took two distinct pulls to free the handle completely. Opening shock followed shortly—not a jolt but a gradual downward type force like a heavy steam cat shot.

With the chute now open, a quick inventory, first of myself and then of my gear, showed everything present and accounted for with one exception. My Boy Scout flashlight which had been hooked to my torso harness was gone. While checking my gear, I heard a hissing sound from my bailout oxygen bottle. My mask had pulled away from my face during parachute opening shock. I pushed it tight and again was getting oxygen. After what seemed like only a minute, the oxygen was depleted. This surprised me because the bottle was full before takeoff. Most of the oxygen must have escaped when my mask was away from my face.

With no more oxygen, I knocked the mask from my face and started breathing outside air. This was real comfortable but I was breathing hard and becoming lightheaded—I was hyperventilating. A conscious effort to breathe more slowly seemed to improve things.

My attention now shifted to the water survival situation coming up. Getting rid of the chute properly on entering the water was my first concern. I checked to be sure the D-handle had been completely pulled; never could find it so assumed it was gone. Next job was to release the rocket jet fittings to free the canopy. The fittings are right on your shoulders when you strap in the plane. After chute deployment they rise to about 12 to 18 inches above your head. I was surprised to find the fittings as high as they were. Decided to leave both rocket fittings to my survival pack connected until in the water. (*This is contrary to recommended procedures and can lead to difficulties.—Ed.*)

Although I couldn't see the water below, the air warmed markedly. Got into position to release the shoulder fittings—hands on fittings, feet together, looking straight ahead as taught in Preflight and Survival School. Hit the water and before my fanny was wet had the shoulder rocket jet fittings off. It felt like only the right one released. I tried to find the left one underwater. However, when the buoyancy of the survival gear popped me to the surface, the chute was nowhere in sight. This surprised me because the sea was almost completely calm. When I released the left hip rocket fitting to the seat pan, the survival gear floated around to my right. (*Best done during parachute descent.—Ed.*)

In the dark I had some trouble locating the O-ring to open the raft pack. I hadn't inflated my Mk-3C flotation gear yet. Wasn't having any difficulty floating but thought I should inflate it. Pulled both CO_2 cylinder toggles and got quick inflation. Found the O-ring to the survival pack. The raft came out easily. Before pulling the raft out I hooked the retaining lanyard to a torso harness shoulder fitting. Inflation of the raft was normal. Righting the raft, I tried to climb in but couldn't get out of the water. After two attempts, noticed that I hadn't released my right hip rocket fitting. Was trying to pull the parachute container and seat pan in the raft with me. After releasing the fitting, I boarded the raft without difficulty. Luckily the sea was almost calm. I entered the raft at the small end and as I pulled aboard, a great deal of water came along—3 or 4 inches deep in the bottom of the raft. Since the water was warm, I decided to wait until later to bail it out.

I now began to straighten up my new home for what could be a good two weeks' stay. Followed the lanyard to the survival gear. Pulled it aboard leaving parachute pack and seat pan in the water as a sea anchor. The ComNavAirPac survival kit in the seat pan would have to wait until daylight. Had all the survival gear on my lap and my Mk-3C flotation gear inflated. The raft was crowded to say the least.

If I had to do it again under the same conditions, don't believe I would inflate the Mk-3C flotation gear. It restricted my ability to maneuver and to handle equipment in the raft. However, once the Mk-3C was inflated, I didn't want to deflate it. (*For more freedom of movement in an inflated Mk-3C life preserver, unhook the snap holding the chambers together and put them behind you, water-wing style.—Ed.*)

My strobe light was on my chest next to my survival knife. I turned it on but the flash in my face was too much to take. Took off my hard hat and put the flashing strobe light inside it at my feet. Read the instructions on the distress signals by the light of my one-cell flashlight to be sure I didn't use the day ends. (*The night ends have "bumps" on them.—Ed.*)

Shortly I heard an aircraft low, about a mile away to the right. Fired two tracers. He made a turn toward me so I got a distress signal ready. As he neared, I pulled the signal. Sure enough, I had goofed and was getting day smoke. I was so mad I couldn't believe it! When the smoke quit, I turned the signal around and ignited the night flare.

The aircraft was one of the carrier's *Willy Fudds*. Each time he made passes in the area I would pop off a few tracers. When it looked like he had a real good run, I used distress signals. Reloading the .38 was no problem after learning one lesson. At first I was just opening the chamber and spinning it with the barrel up. Some of the shells were not falling out and in the dark I was trying to put good shells in on top of empties. After that, I pushed the plunger that empties the chamber and had no more problem.

When the E-1B was out of sight for a while, I broke into the PRC-17 radio pack. Read the directions carefully, then tried to operate it for 20 minutes. Never heard a thing from it, not even the small noise you're supposed to hear in the receiver. When the *Willie Fudd* came back, in the excitement of grabbing the pistol, I got the radio wet in the bottom of the raft. Later tries with it were fruitless.

On the second series of passes, the WF came closer. The fireworks and flack I was throwing up kept him at a little distance. His blinking landing light indicated he had sighted me. Thirty minutes later, I saw lights on the horizon. They moved steadily toward me until they were only about a mile away. By now I had my hard hat back on and was holding the strobe light overhead. Later learned search personnel had no trouble seeing the strobe light flashing against the helmet's reflective tape from a distance of eight miles.

Underwater Escape

After landing aboard ship following a 2½ hour flight, the pilot was directed to taxi the A-4B to the no. 1 elevator, apparently to be sent to the hangar deck. Just aft of the elevator, he was stopped by a director who indicated he was to proceed instead to the no. 1 corridor on the flight deck. A tiller bar was put on the nose wheel and the aircraft was turned and moved ahead in this direction. Instead of being turned to port as intended, it continued straight ahead and went over the starboard side. Flipping over, the plane dropped to the water on its nose and back.

"As I started over the side," the pilot recalls, "I thought immediately of ejection. Decided, however, that with near-zero knots the short fall with the aircraft would be better than an ejection attempt so far outside the envelope. The thought of canopy jettison occurred to me at a point where all I could make myself do was hold on. The aircraft caught something for a split second, then continued down, flipping slowly on its back.

"Entry into the water was made with a jolting stop, but was in no way physically damaging. Do not even recall closing my eyes and could see around the cockpit immediately. Got one good deep breath of oxygen before the cockpit and my mask filled with water. Vividly, I remembered the now invaluable Dilbert Dunker training received in Preflight. Hesitating for several seconds, I waited for everything to settle down before taking any action. When I discovered it was impossible to breathe because of the water in my mask, my actions became jerky so I will describe them this way:

- Pulled oxygen mask off . . . still nothing but water.
- Grappled for the canopy jettison handle but couldn't find it.
- Pulled the face curtain and stared at it in front of me. (Distinctly remember sliding my hands between helmet and canopy.)
- Reached up and behind my head to get better leverage and grasped both edges of the curtain and jerked. Nothing. (This time do not remember anything about the canopy.)
- Reached between my legs and pulled the auxiliary handle with both hands. It came up several inches to the stop but with no results. (*Note: Ejection seat will not fire unless canopy is removed on this aircraft.*)
- Finally found and pulled the jettison handle. It came loose in my hand with no resistance and no action.
- Was fumbling by this time. Grabbed for the normal canopy actuator. Although remember finding the flap handle, throttle, and navigation bag, could not find the canopy handle. At this point, although I'm sure it was not a completely rational thought, wondered why the cockpit had filled with water so fast. Reached up—*there was no canopy!* With this knowledge I could work a little more efficiently again. The harness release handle freed me with one quick pull. Pulled forward with the glare shield, stood up, and pushed down on the canopy bow. Kicked clear, pulled the Mk-3C toggles and immediately surfaced.

"The angel was overhead when I broke the surface and a crewman joined me in the water. After one abortive attempt (the sling latch was not secure) he had a sling around me and we were both raised to the helicopter. In a moment I was back aboard ship.

"If there is one area in the water phase that I would like to pass on, it is that all pilots, as they review their escape procedures, consider the cockpit layout in terms of such strange environments as poor lighting, no oxygen, and topside down in seawater. If one likely possibility were to have been added to my case—injury—I might not have been so fortunate as I was.

"I think the whole rescue operation was handled extremely well. Having the crewman with his knowledge of rescue equipment and procedure join me in the water was excellent. I would recommend it in similar instances where sea conditions would not place the crewman in jeopardy.

"The only change I would recommend in the procedure used did not occur to me until after the recovery. The torso harness is fitted with a special strap and D-ring designed for helicopter hoist rescue. Snapping the hoist cable directly to it would be more secure than a sling. Perhaps sewing a bright colored patch to the strap would draw attention to the hoist strap when a pilot is incapacitated or, as in my case, forgets about it!"

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NO SMOKING, PLEASE!

Regardless of all the rationalizations used to justify it, the fact remains that individuals are suffering physical harm by smoking.

Recently the American Thoracic Society cited 37 different studies in this country and abroad which are stated to establish beyond doubt that there is a relationship between cigaret smoking and lung cancer. Even more recently, the U. S. Public Health Service released its now-famous report on the association between smoking and various diseases.

Lung cancer gets most of the publicity—it is more dramatic and more sensational. In 1962 there were 42,000 deaths in the U. S. from lung cancer—1000 more than occurred from auto accidents and more than the total of three years of U. S. fatalities in the Korean War. Practically all were associated with heavy smoking. Cigaret smoking has also been cited as a cause for cancer of the lip, mouth, larynx and urinary bladder. And it is known that heavy smoking makes treatment of respiratory infections and gastrointestinal ulcers less effective.

But more important to the health of the nation as a whole are the insidious effects that smoking produces in the heart, lungs, and blood vessels. Every puff inhaled causes irritation to the lining of all the tubes, large and small, in the respiratory tract. This produces edema and swelling, preventing air passing in and out freely. Some of the air is trapped and retained, causing lungs to be in a state of overexpansion. When this continues day after day, week after week, month after month, and year after year, the final result is a loss of the normal elasticity of the lungs—and thus irreparable damage.

The ultimate result is chronic bronchitis and overdistended lungs—emphysema. This causes shortness of breath and the inability to obtain enough oxygen. Finally, if you keep on smoking you can become a pulmonary cripple and spend your remaining uncomfortable days in a wheel chair.

Emphysema stands next to heart disease as a cause of total disability in the United States. In 1960 alone there were 12,000 proven new cases of emphysema, and all in patients who were heavy smokers.

"What about the heart?" It has been proven that the nicotine in tobacco is a potent vasoconstrictive which causes blood vessels to tighten up and reduce the flow of blood. By smoking just one standard-size cigaret, the skin temperature of your foot will be lowered about 5° F. This constriction of the small arteries occurs also in other vital organs, such as the heart and kidneys. This poor blood supply to these organs may eventually predispose to catastrophic events such as heart attacks. More recently, it has been experimentally proven in animals that nicotine in small amounts in the blood stream will cause the blood to clot faster and more easily. This fact, along with its vasoconstrictive action, makes it a double-barreled weapon as a possible cause of thrombosis (plugging with a clot of blood) of small arteries in vital organs such as the heart. A spokesman for the American Heart Association recently stated that middle-aged smokers have a 50% to 150% increase in heart attacks over non-smokers.

No matter how much, or in what way smoking is rationalized, it cannot counteract the large volume of indisputable evidence which has been accumulated linking cigaret smoking to adverse effects on the human body. What one really needs in order to stop smoking is a good motive and strong will power. What could be a more important motivation than one's own health? . . .

—Adapted from 5th Air Force Safety News

The Battle of the Bulge

THE Chief of Naval Personnel has instructed all commands to enforce weight reduction for those Navy members who are obese or overweight.

Steps to be taken in the battle of the bulge are outlined in BuPers Instruction 6100.6 of 26 March 1964. Obesity actually constitutes an abnormal state of health. Commands are giving particular attention to the general appearance and physical condition of assigned personnel as related to obesity.

Statistics clearly show that the mortality rate increases with the degree of obesity and that obesity contributes to excessive sick days and premature onset of certain physical impairments.

Medical officers will examine overweight personnel to determine:

- whether the condition is due to obesity or unusual body structure
- whether the condition is caused by dietary indiscretion (such as overeating) or as secondary to an underlying abnormality
- how the condition may affect health or physical fitness and
- whether the condition will permit an enforced weight reducing diet and exercise schedule.

If a patient does not reduce sufficiently during a six-month diet and exercise period, he will be recommended for discharge due to unsuitability. Discharge will also be recommended if he loses weight and later gains back the excess weight.

Admission to the sicklist and hospitalization is ordered in those cases where further evaluation is necessary and where overweight condition is due to an underlying disease process.

Salvaged Flare

A TOTAL of four Mk 13 Mod 0 distress signal flares were available to the three downed aviators (two instructors and a student) in an AF-9J mid-air accident. They fired the flares relatively early in the survival period but SAR aircraft did not see them. Two of the flares worked but the actuating rings broke off the others. One of the pilots was able to salvage one of the flares by twisting the actuating ring.

When the survivors saw another SAR aircraft, they actuated the salvaged flare with a pocket knife can opener. This was the signal which led to recognition and rescue.

Burning Ears

FIRE protection afforded by the APH-5 helmet was demonstrated in the crash of a patrol plane.

One of the surviving crewmen, the report states, "routinely wears his APH-5 helmet but habitually does not tighten his chin strap. His helmet was knocked off his head on impact. He suffered first and second degree burns of his ears."

A second crewman was wearing his APH-5 but "lost" it—when or where he does not know. Burns of the ears and scalp indicate he lost it prior to escape

from the wreckage. He admitted that he usually does not pull the chin strap tight after putting on the helmet and had not done so this time.

A third crewman did not remove his APH-5 until he was clear of the wreckage. His head burns were minor, involving only his nose and right cheek.

Vest Lights

VEST lights are being provided for flight deck personnel on one large carrier. If a man should fall or be blown overboard at night, a one-cell life vest flashlight is a great aid for quick location and pickup.
—Safety Council Minutes

Heater Fumes

ON a scheduled local post maintenance check training flight in an EA-1E, after the radar had been secured due to an overload, the radar operator in the No. 3 position advised the pilot that he detected smoke. The smoke appeared to be coming from the "maggie" area. The pilot instructed the crewman to put on his oxygen mask and to go to 100% oxygen. Immediately they returned to the field, landed, taxied off the runway and shut down. All three crewmembers evacuated the plane.

On reaching the ground, the radar operator passed out due to the effects of smoke inhalation. Inspection of the plane showed that the heater in the radar operator's compartment was operating improperly.

Although the radar operator had put his oxygen mask on, he had apparently failed to turn on the oxygen supply. Instead, he had put the diluter valve in the normal oxygen position. Instead of breathing 100% oxygen, he had breathed contaminated air for some 13 minutes.

Squadron CO's comments: All personnel have been reinstructed in the proper use of all survival equipment. This includes blindfold check-outs on the operation of oxygen equipment.

Shoulder Holster

ALL flight crews should be aware that the spring clip holster for the .38 cal. pistol is *not* an authorized item. The authorized shoulder holster is FSN 241095-714-2700 in accordance with Nav-Ord List 23874.

MC-3A Connector O-Ring

A near-accident in a T33 aircraft recently focused attention on a very small piece of equipment and the important role it plays. The white O-ring rubber seal on the MC-3A connector of the A-13A oxygen mask makes an airtight fit at the quick-disconnect fitting and covers small ports in the connector. Absence of this rubber seal allows cockpit air to be inhaled in greater quantities than oxygen from the regulator. A small flow from the regulator is also elicited by inhalation, causing the flow indicator to blink.

In the incident reported, lack of this O-ring plus an inadequate cabin pressurization contributed to hypoxia on the part of the pilot. His hypoxic impairment of judgment showed in his *removal of his oxygen mask* rather than switching to the bailout oxygen system after he received no relief of symptoms on 100 percent oxygen. His controlled descent from altitude to regain useful consciousness was probably an automatic response from long training.

The MC-3A connector should be examined carefully for presence of the O-ring. The O-ring's resiliency should be verified during each cleaning and inspection of the mask by the Aviation Equipment Division. This should be included in the preflight inspection of the mask. BACSEB 2-56 applies.

NAS Seattle—Momentary distraction caused this altercation between a hangar door and a steel-toed shoe. The wearer was able to participate in a physical fitness program three-mile forced march 15 minutes after this incident. Safety shoes saved the foot.

It's what's up there that counts

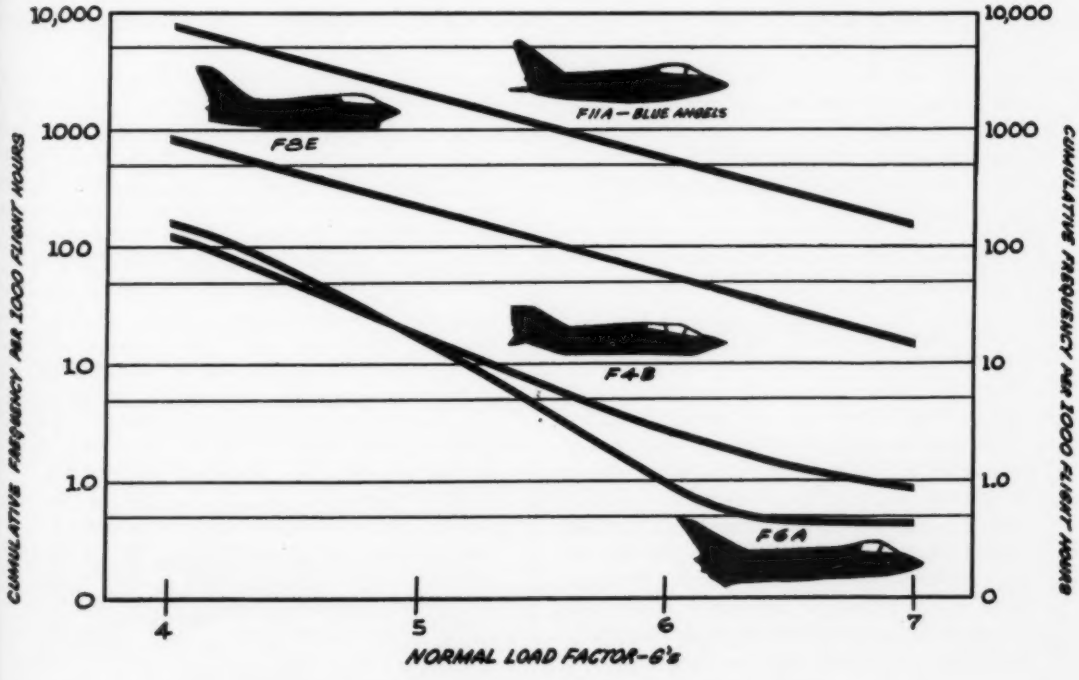
By E. P. Roeser
Aeronautical Structures Laboratory
U. S. Naval Air Engineering Center

High G maneuver causes compression wrinkles to develop on upper wing surfaces. Recording repeated exposure poses problem.

A fundamental requirement of flight is keeping takeoffs and landings in a one-to-one ratio. For various reasons, sometimes because of structural failure, we have not been able to achieve this ideal. For example, aircraft structural fatigue has been the subject of considerable study, since it is a factor that must be considered in the structural design and use of the aircraft. Generally the useful life of an aircraft is based on the total number of flight hours on the airframe. However, it is a matter of record that structural failure due to fatigue has caused accidents. It is now accepted that cycles of fatigue-load history cannot always be directly compared to total flight hours on a given airframe.

A problem exists in the day-to-day operational use of military aircraft in keeping track of individual aircraft that are exposed to repeated high maneuver-load factors. A pilot report of a maneuver load in excess of the limit-load factor at the completion of a mission is routine. A detailed inspection of the aircraft structure for visible evidence of overstress, such as popped rivets, cracked paint, and buckled skin, may result in downing the aircraft for detailed inspection and repair. However, the true extent of fatigue damage to an aircraft may not be visible. It has been found in laboratory fatigue tests of airframe components, under close monitoring, that fatigue cracks may remain undetected prior to complete structural failure.

It has been shown that repeated applications of loads less than the known static strength can eventually lead to structural fatigue failure—which proves the analytical theory of cumulative damage. The accumulation of repeated aircraft maneuver loads, large and small, can be compared to filling a bucket with stones of various sizes. When the "bucket is full," the theoretical fatigue life of an airframe is expended. Aircraft structural fatigue is a fact of life that cannot be treated lightly. Every airframe has a finite fatigue life. However, confidence gained through long-term development of fatigue-resistant structures makes airframe failure highly unlikely in normal service use. But, rapid advances in weapon-system design have resulted in changes in the expected usage, growth potential, and mission of naval aircraft. There is also an urgent need to stretch the useful life of an airframe. Being able to predict fatigue life with greater accuracy permits optimum



Typical normal load factor experience of Navy Fighter Aircraft

Counting accelerometer indicator located for convenient reading.

use of the aircraft and conserves three things the Navy holds dear: pilots, airframes and dollars.

To help the Navy gather flight-load-history data on individual aircraft, a load-cycle counting device is being installed in most models on the assembly line. It is planned that fleet-wide use of the counter will provide vital load-history data to squadrons and BuWeps.

The counter system operates on 28 volts dc and records vertical accelerations experienced in flight. The instrument is powered by a wheels-up microswitch on most aircraft models. Therefore, the instrument will not record catapult or arrested landing loads. The system weighs about 3 pounds and requires little or no maintenance. The heart of the system is the accelerometer transducer located at the aircraft center of gravity. It consists of a weight on a coil spring. The weight is free to move in the vertical direction only, when sensing aircraft vertical accelerations. The displacement closes electrical circuit contacts which in turn actuate the counter corresponding to the g-level experienced.

The accelerometer transducer is mechanically damped so that buffeting experienced during a maneuver would not result in extraneous counting. The range of g-levels of the four windows on the indicator is listed in BuWeps Instruction 13920.1A of 8 August 1963. For F-4 and F-8 aircraft, the levels are 4, 5, 6, and 7g. The four-digit counter appearing at each g-level counter is not set at zero when the instrument is installed in the aircraft. Therefore, the order and the actual reading of the numbers in each g-level are not related. But, when read periodically and reported on the sample report card shown in Fig. 1, the difference in the readings of each level since the last readings is the number of times an aircraft maneuver load is experienced at each of the four load intervals. A 6g maneuver would be counted on the 4, 5, and 6g windows as one count at each level. The indicator accumulates the number of times flight-maneuver acceleration levels are equaled or exceeded. BuWeps Inst 13920.1A sets forth the procedures for submitting the accelerometer readings report depicted in Fig. 1.

The purpose of collecting the data reported to the Aeronautical Structures Laboratory of the Naval Air Engineering Center is twofold: first, it is a valuable tool to keep squadrons informed of the maneuver-load history of individual aircraft; secondly, the data are a vital source of information to technical personnel of BuWeps Airframe Design Division and the contractor responsible for the design and test of aircraft. Data are being used now in the laboratory for realistic fatigue-test loading based on fleet experience. Tests are conducted in order to establish a basis for extending the service life of older aircraft. The counter data have also been used in accident investigation work. In a recent F-8C accident, the charred

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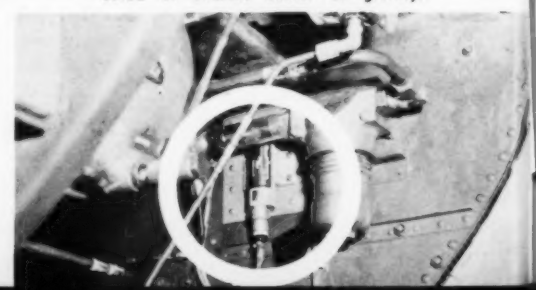
Don't Mix

Two vendors, Giannini and Maxon, are presently supplying the statistical accelerometers. Each instrument consists of two units, an indicator and a transducer, and must be matched as to manufacturer, if a Maxon indicator is connected to a Giannini transducer and vice versa, the wire bundle connecting the two is not electrically interchangeable since the connector pins have different functions in the two instruments. Therefore, if one unit of the instrument goes bad, it is much simpler to replace it with a unit by the same manufacturer; otherwise, both units and the connecting wire must be changed.

Counting accelerometer transducer located at aircraft center of gravity.



INSTRUCTIONS FOR PREPARATION OF NAVWEPS FORM 13920/1

1. Date: Enter date for last day of month covered by report for the monthly submittals; for the situation submittals enter date of occurrence.
2. Activity: Enter name of reporting activity.
3. Aircraft Model Number: Enter model number of the aircraft covered by report.
4. Bureau Number: Enter the bureau number of the aircraft covered by report.
5. Transducer Serial Number: Enter serial number of the transducer covered by report.
6. Indicator Serial Number: Enter serial number of the indicator covered by report.
7. Flight Hours by Flight Purpose: Enter flight hours in accordance with the following: (a) Enter flight-hour items in hours and tenths, and enter a dash (-) in each space where there is no information, (b) Flight hours for codes not shown shall be listed in space marked "Other" with the code clearly designated. If space for more than one code is required, spaces provided for categories for which there is no information may be used. In the latter cases, code listed shall be crossed out and appropriate code plainly marked. The selection of codes should be in accordance with requirements of OPNAVINST 3760.8.
8. Number of Flight Hours Since Last Report: Enter number of hours aircraft has undergone flight since last report.
9. Total Aircraft Flight Time: Enter total number of hours aircraft has undergone flight.
10. Maximum Permissible Acceleration in Effect for Reporting Period: In entering "Maximum Permissible Acceleration in Effect for Reporting Period" as stated in the Aircraft Flight Handbook, interim revisions, or other directives, particular attention must be given to the fact that, for some models, maximum permissible acceleration will vary between individual airplanes of the same model depending on whether or not a particular Aircraft Service Change has been installed, total flight time for the aircraft, or for other reasons.
11. Readings - Counters 1 through 4: Enter present readings for counters 1 through 4.
12. Remarks: Self-explanatory.

COUNTING ACCELEROMETER READINGS REPORT
NAVWEPS FORM 13920/1 (5-61) (BACK)
REPORT SYMBOL BUWEPS 13920-1

ACTIVITY	AIRCRAFT MOD.	BUREAU NO.	TRANSDUCER SERIAL NO. / INDICATOR SERIAL NO.	DATE	DO NOT WRITE BELOW

FLIGHT HOURS BY FLIGHT PURPOSE			
1,2&5 (A-1)	8 (A-1)	NO. OF FLT. HRS SINCE LAST REPORT	
3&4 (A-1)	9 (A-1)	TOTAL AIRCRAFT FLIGHT TIME	
6 (A-1)	0 (A-1)		
7 (A-1)	OTHER	MAX. PERMISSIBLE ACCEL. IN EFFECT FOR REPORTING PERIOD	

READINGS	1	2	3	4	
PRESENT					

REMARKS

S-80888

Fig. 1: Sample counting accelerometer postcard reading report form.

Data Available

Some 230,000 flight hours by 879 operational fleet aircraft equipped with the counting accelerometer system are contained in Aeronautical Structures Laboratory Report No. NAEC-ASL-1075. These data furnish information concerning the number of times four preset acceleration levels are experienced by aircraft during operational employment.

The system thus provides squadron personnel with a means of surveillance of the severity of usage of their aircraft. Also, the record of service usage that these instruments provide will be of assistance in forming judgments arising from consideration of aircraft fatigue. Histograms, cumulative frequency distributions and probability curves are presented in this report.

Commands can obtain copies of this report from Defense Documentation Center, Cameron Station, Alexandria, Virginia.

counter indicator was removed from the aircraft and brought to the laboratory. Although badly damaged the number on the back side of the counter wheels was readable. The number of counts equaling or exceeding the 7g level indicated that the aircraft had a history of being overstressed.

A Naval Air Engineering Center report, issued quarterly, summarizes all data from reporting aircraft. More than 100,000 flight hours of counting accelerometer data have been collected to date. The reported data is presented in the form of time spent in air-to-air, air-to-ground, and general flight-mission categories; maneuver-load occurrence per 1000 flight hours; probability of equaling or exceeding a given normal load factor; and a listing of individual aircraft recorded load histories. The report is circulated to squadron commanding officers, contractors, and government agencies interested in the results of the fleet-wide survey. This broad sample of load history of fighter, attack, training, and utility aircraft can go a long way toward providing the background information necessary for the development of more scientific methods and techniques of predicting the effects of fatigue on the strength and reliability of aircraft structures. At the same time it provides information on the severity of flight conditions imposed under new training programs and the development of new tactics.

The statistical survey of aircraft flight loads by means of the counting accelerometer is long range in nature. It is not intended to emphasize short-range bursts of flight activity, or is there any attempt to identify individual pilots in any way in the flight maneuver-load rates. It is hoped that we can get a handle on the problems of making realistic estimates in extending the service life of aircraft and to provide more sound strength and structural reliability requirements for future aircraft.

Case in Point

Bucket Full

HERE'S a T-1A yellow sheet write-up, corrective action and the ultimate findings:

"At 400 knots, 6G loud bang-light came ON in gear handle. Gear indicators flip flopped. Everything went back to safe indication. Outside observer noted port inboard LG door open. Lowered gear, indications safe. Landing O.K. but port inboard door still hung open." The aircraft was downed by the pilot.

"Cleaned lock and adjusted. Lubed same. Check's 4.0 on dropcheck."

The airplane was then returned to the line in an UP status. During preflight inspection the plane captain discovered a 1" x 4½" section of fairing missing from the hinge line of the port inboard landing gear door. The aircraft was returned to the hangar for further inspection where it was found to have a cracked wing spar in the area of the port wheel well—see photo. Engineering analysis declared the airframe a Category I *strike*.

Quality control procedures were examined and determined to be in order. Because the airplane had not exceeded the maximum allowable 7.33 positive G limitations, a more thorough inspection of the airframe was not considered justified at the time of the downing writeup.

Examination by O&R Materials Laboratory of the cracked spar and associated hardware in the wing and fuselage revealed the parts

Discovery of missing fairing (circled) led to . . .

failed as a result of overloading. Nothing was found to indicate whether the failures resulted from a single or an accumulation of flight overloads.

Conclusions of the accident board: The primary cause of this accident was established as material failure of the front main spar and associated parts as a direct result of overloading in excess of the ultimate load factor.

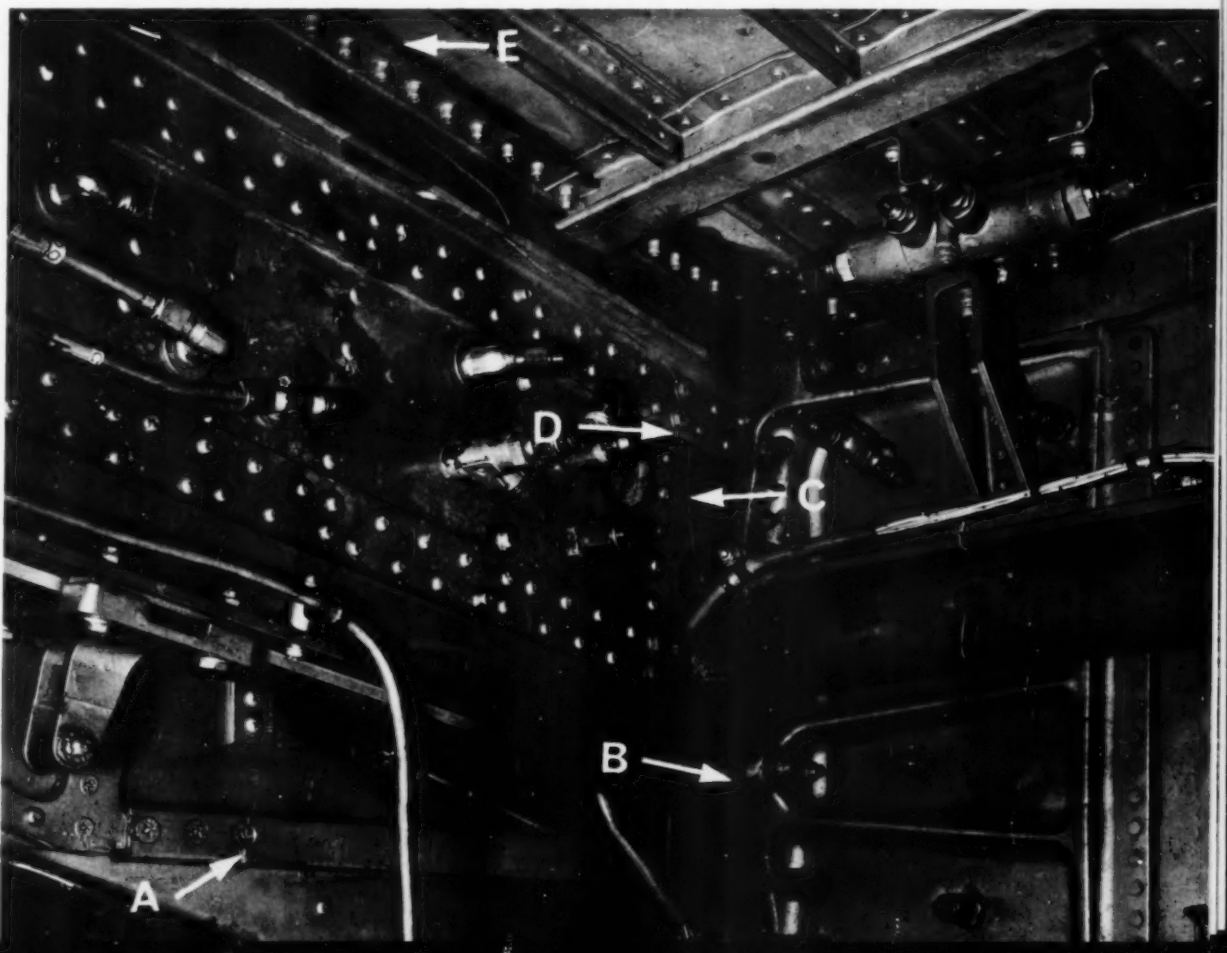
Although visual or documentary evidence of overstress to this aircraft during previous flights could not be found, it is strongly suspected that unreported overstresses had occurred during the service life of the aircraft. *An accumulation of overstresses, however slight, will in time cause the airframe to fail.* In this mishap the failure occurred at 6.3 positive G, well within the operating limits of the aircraft.

The board also noted that although maintenance personnel and procedures were not considered to be contributing cause factors in this mishap, a more stringent inspection would preclude future instances of a downed aircraft being erroneously placed in an UP status.

Recommendations included the installation of a recording accelerometer in this model aircraft.

The need for more thorough and clear yellowsheet writeups is also most evident in this case. An endorsement states, "Individual pilots must assume the responsibility of following up their written discrepancies and whenever possible, discussing with maintenance personnel the details of problems encountered."

. . . . closer inspection and discovery of cracked channel (A) and cracked wing spar (B through E).



NOTES AND COMMENTS ON MAINTENANCE

Beware of Jet Blast

JET BLAST from an A-4C combined with a 36-knot wind-over-deck damaged the wing, wingfold mechanism and wing butt of a *Stoof* during carrier operations. See photo at right.

At the time the jet was poised on the port catapult turning up at 100 percent. The *Stoof*, with wings folded was taxiing into a position about 50 feet aft onto the no. 2 elevator. Although the port blast deflector was UP, it was not high enough to prevent blast from causing the starboard wing to rise to a vertical position where it abruptly stopped and a severe hydraulic leak developed.

Several similar occurrences on record indicate that handling crews may not be aware of the strength of exhaust velocity produced by an A-4C. The Flight Manual shows that at 100 percent power the exhaust velocity 80 feet aft will be 100 feet per second (59 knots). The velocity formed by the jet blast in this incident cannot be determined exactly but it is apparent that when combined with a wind-over-deck of 36 knots it was sufficient to exceed the wingfold system structural limits of the *Stoof*.

Aircraft handlers were cited as a contributing cause of this mishap in that they permitted an aircraft with wings folded and without jury struts to be taxied to a position too close behind the jet blast.

Jet blast combined with wind-over-deck caused damage to stoof wing and wingfold.

Flashlight, Anyone?

SHORTLY after takeoff, an A-1H encountered problems of an unusual nature, a tendency to roll to the left. The pilot checked his aircraft and elected to return to the ship. His usual approach was not successful and he was diverted to the beach where a landing was accomplished without incident.

Examination of the controls revealed that the controls were jammed by a flashlight that had been left in the forward hell hole two days prior to the flight.

This situation could have been prevented by strict compliance to tool accountability procedures during the period of inspection and repair.—*Anymouse*

Over Age Hose

A DROP in engine oil pressure and increased oil temp during test flight led to the discovery of this engine oil inlet hose failure. The hose did not rupture externally—it was cut open to show internal collapse. See photo, right.

It was noted from the cure date on the hose that it had been used on the aircraft from one engine to another. It was more than 5 years old (the cure date limit) when this engine was installed.

The reporting unit directed maintenance and supply to take measures to preclude the possibility of material use which is at, or near, expiration of use date. Accessories Bulletins 22-61 and 8-62 Supplement 1, apply.

Can this happen in your outfit?

Internally failed hose was over age.

Maintenance Memo

From: Maintenance Officer
To: All Pilots, Flight Crewmembers and Maintenance Personnel
Subj: Yellow Sheet Write Ups

If one examines the "B" sheet files on this squadron's aircraft he will come to the startling conclusion that there is an underground war of no small dimensions going on between flight crew and maintenance ground personnel. Manifestations of the war of which I speak may be observed on the "B" sheets as follows, and I quote:

a. *"No. 1 ADF Inoperative."*
"Operated No. 1 ADF for 15 minutes. Works good."

b. *"Fwd IFR Pump Inoperative."*
"Operated fwd IFR pump on the ground for 5 minutes. Checks OK."

c. *"Left Rear Tire Needs Changing."*
"Checked left rear tire. Within limits."

d. *"No 3 Engine Peaks at 870° on Start."*
"Started No. 3 engine twice. Peaks 790°".

e. *"Brakes Grab While Taxiing, Brake Selector Emergency, Anti-Skid Off."*
"Checked brake pressure (1750 psi). Checked disc. OK."

f. *"ATM Bleed Air Shut-Off Valve Sticks Open."*
"Checked system—found no discrepancies."

g. *"Radar Spoking."*
"Checked APN 59 out 15 minutes. Found no spoking."

Now this is an unhappy state of affairs when we are all members of the same team. In addition, since such a war is not authorized by those charged with authorizing wars nor by our own Commanding Officer, it might be in the best interests of all of us to see if we can't bring about a truce. In the process we may achieve improved inflight reliability of aircraft and aircraft systems, reduce maintenance down time, eliminate repeat gripes and generally improve the relationship between the "Fraternity of the Sky" and the "Royal Order of the Wrench." It is even possible that M/SGT Mc Grouch or Chief Hammer might be induced to smile occasionally, which is a wonderful goal indeed.

The cause of conflicts of the type referred to herein can usually be traced to one or more of the following ill-founded assumptions on the part of the various groups involved:

a. *Flight Crews*:
1. Since I have a memory like a computer, I'll just write up these 15 gripes in brilliant detail after we chock back at homeplate.
2. I'll just tell them what to change and save them the problem of analyzing the discrepancy.
3. The Night Crew's eyes will be tired at 2330 so I'll just be brief since they are pretty good mind-readers anyway.
4. It will be a real joke if they can't figure out what I mean by this.

b. *Ground Crews*:
1. What the hell do they mean "inoperative?" It works fine here on the ground as any fool can plainly see.
2. Flight Crews hate us and write up perfectly good equipment because it is only thing they have to do besides count their flight pay and per diem.
3. They can't tell me what to do. I know better.
4. Maybe if we ignore it, it will go away.
5. Changing a black box will cure anything.

Now as the first step in restoring peace, prosperity and good order and discipline I propose that all hands who might be tempted to write with their ballpoint pens, "Ground Checked OK" or anything that means essentially the same thing, stop doing this—*now!* It is not well received by pilots and you have no idea what an effect it has on a Commanding Officer when an entry like this turns up on *his* yellow sheet. I made such a mistake years ago when I was an eager young mechanic and I have no difficulty remembering the startling results to this day. Amazing! So much for this, since we are no longer going to use this term.

Let us assume that if the flight crew thinks that the wheels did not come down when the handle was moved to the down position, that the subsequent physical drill with the cranks, or some such similar activity, was not a figment of their imagination. On the other hand, Flight Crews will not be deemed forward and ungentlemanly if they will enter such choice and informative tidbits as "UHF No. 1 operated strangely after a cup of hot soup was poured over the control box." Troubleshoot inflight and suggest possible remedy but also enter all associated observations and symptoms so that the folks on the ground have a chance to figure out the problem just in case your brilliant diagnosis is all wet.

Let's give it a try! —*3rd MAW*

Letters

Ditch or Eject

FPO, San Francisco—Lieutenant Commander F. J. Pester wrote a comprehensive and well documented article on whether to "Ditch or Eject" in the July issue of APPROACH; however, I believe he reached the wrong conclusion in one section.

After giving three tables of figures and two charts which show 23 fatalities out of 31 *ditching* situations and 9 fatalities out of 23 *ejecting* situations, he states, "Like it or not, we are automatically eliminating one course of action and committing ourselves to *ditching*." This statement is in such disagreement with the evidence given, that I believe the typist or the linotype operator inadvertently typed in *ditching* instead of *ejecting*. Request you clarify.

CHARLES E. BRONSON
CAPT, USMC 1ST MAW

• Thank you for your letter. Here is LCDR Pester's comment: "The statement is made relative to timeliness of action. That is, if we wait too long and altitude is decreasing, we end up in the water 'ditched' whether we meant to or not. The sentence in question should have been part of the preceding paragraph in order to eliminate the confusion."

Los Angeles—LCDR F. J. Pester should be congratulated on his coming to grips with a very touchy and complicated problem. I should like to add a few thoughts, however, which are amplifications to some of the article's points as well as a new thought or two.

First is this matter of time for decision. Based on studies of F-8 carrier accidents Joe Barton and I made a few years ago, I feel that a *minimum* of 3-5 seconds will elapse before a pilot can go through the perception (of the emergency), decision (eject or stay), and action (keep flying or pull the curtain/canopy). This means that the act of the canopy coming off, the seat moving or what have you, occurs a finite time from whatever occurs that precipitated the emergency action. This time means aircraft distance traveled and can establish a different set of conditions than existed when and where the emergency started. This alone means that in the case of a landing accident, and to a lesser degree in cold cat shots, the aircraft is off the level platform (the deck) by the time the pilot's reaction has taken place. The influence of aircraft sink rate can then be highly significant.

In my opinion, the accident (illustrated on p. 4 in the article and featured before in APPROACH) was very much the exception to the rule . . . something like 2.9 secs. from deck impact to start of ejection sequence . . . something that had a rather unique set of motivation and training factors attached to it.

What I am really leading to is the matter of control of the aircraft. Many of the around-the-deck fatal accidents Joe and I saw resulted when the pilot quit trying to keep the wings level, and indeed, failed to gain at least a few hundred feet altitude to significantly improve survival chances by using the seat, something he probably could have done if he had tried. Of course, I am speaking primarily of the landing accidents but a couple of F-8 cat shot accidents fit this picture too, (obviously without thrust, airspeed and/or control, a different problem—one which I think LCDR Pester treated quite well). But continuing my "control" thought, there arises then a very gray shade of gray relative to how long a pilot sits around waiting to see if the airplane will go where he wants it to go when—if it doesn't—he has lost precious time and perhaps what small advantage he had to start with.

This is a real hooker but the answer lies in what you expect or what experience has taught you to expect from the aircraft configuration you are flying. In the F-8, it takes a real belt to get at the longitudinal or lateral control system severely enough to destroy their effectiveness immediately. (The controls are routed above a good energy absorber—the engine.) Even when the PC accumulators are broken off in the event both main gears are knocked off, experience that I saw permitted time to gain several hundred and sometimes several thousand feet of altitude. I have often thought these concepts should be part of specific flight controls design criteria for carrier aircraft but never got around to putting it in writing.

In any event, to summarize, I think the time to perceive, decide and react factor is critical (and not generally appreciated); the controllability factor not always used to best advantage; and there could well be differences between aircraft which preclude generalizing on procedures (not to mention differences in accidents!).

As a final separate point, I suggest a "go slow" on underwater ejection based on two problems. First, man's lungs were not made to function inside the "torpedo" the man becomes when he fires the seat underwater, especially if the seat goes up towards the surface. Second, the test results I have seen on this suggest a profound entanglement problem relative to seat-man-parachute separation in the water—so bad, in fact, that we used to teach (and presumably it is still taught) to use underwater ejection only as a very last resort in clearing the aircraft in the drink.

C. O. MILLER
AEROSPACE SAFETY DIVISION
UNIVERSITY OF SOUTHERN CALIFORNIA

• Here are the author's comments on the above letter:

"The point of control protection is very noteworthy and I agree that it should be a consideration in controls design criteria—not only with the view of protection from

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. Views expressed are those of the writers and do not imply endorsement by the U. S. Naval Aviation Safety Center.

deck crash damage but also in combat or anti-aircraft fire protection. However, most of our high performance jets do have duplication in control systems as you know, and I feel that the escape decision is made in the carrier environment crashes not so much from control availability as from insufficient speed to maintain control (cold cat shot . . . taxi . . . or ramp strike). Again, because of the large number of variables it is difficult to tell a pilot to 'wait and see if he has control of the aircraft,' for even if he did, he might not have the thrust to maintain speed for control or climb. I believe this is something a pilot can sense in the cockpit, however, and will base his decision to attempt climb or eject immediately accordingly.

"The time to perceive, decide, and react will vary greatly and, I believe, is also based very much on the events in the cockpit leading up to the emergency. For example: on a recent F-8 ramp strike, the pilot stated that he knew he was going to hit the ramp 2 seconds prior to actually striking it. At this time he made the decision to eject if he was not arrested. He failed to arrest and sensing this, ejected just as he crossed the No. 2 elevator. He experienced a successful ejection with 1½ full parachute oscillations prior to water landing and was rescued uninjured.

"Underwater ejection with our present escape systems is still considered as the last resort in underwater egress. An underwater escape capability for ejection seats being considered includes in its design incorporation of compressed air to serve as the propulsive force and a disconnect feature which will not allow the personnel parachute to deploy upon seat separation. The problem of excessive lung pressure on the ascent, of course, is a real problem at great depths but perhaps with proper training this could be overcome."

Crash Crew Fam

Naha Air Base—A two-day Crash Crew Familiarization program was staged here to acquaint crash crew personnel, many of which are foreign nationals, with the SP-2H aircraft and its systems. Included were aircraft and cockpit check-outs, escape route briefings, ordnance, hazardous cargo familiarization and question and answer periods.

Although familiarization in some areas was curtailed by classification of information, the interest shown by the crash crews was firm assurance that the program had achieved its purpose.

Effort along these lines not only promotes a better understanding of each other's problems, but also gives the flight crews added comfort in knowing that, if needed, the crash crew will be better able to perform its mission.

F. H. WOOD, LT
SAFETY OFFICER VP-17

• **Good Show—Safety is everybody's business.**

Mk-3C Inflation

FPO, San Francisco—How many persons know what occurs if the Mk-3C life preserver is deployed in the water before release of the parachute riser rocket jet fittings on the integrated torso harness? Answer: Extreme difficulty in releasing the fittings. Reason: Bladders float up and cover the rocket jets. We assumed this to be common knowledge among fellow jet types using similar survival gear, but casual inquiry has proved us wrong. We checked this out in San Diego's Mission Bay behind a friendly tech rep's motorboat and, sure enough, found that a survivor will have the devil's own time, and swallow a quantity of salt water before getting free (if at all) of the risers if the proper sequence is not followed.

SURVIVAL OFFICER EMERITUS

• **Conditions encountered behind a motorboat are quite different from actual parachute drag. NASC is currently of the opinion that inflation of the Mk-3C life vest prior to rocket jet release might be a good idea. CNO, on NASC's recommendation, asked BuWeps to evaluate water entry procedures. Should evaluation results warrant, training aids and survival procedures will be modified and the information disseminated to NATOPS model managers. Thank you for letting us have your thinking on this problem area.**

Water Rescue

Cherry Point, N.C.—Recently we have been conducting water survival training and have run across a couple of tips on helicopter rescue procedure.

It has been advocated for some time that helmets be worn for helo pick-ups for protection. We have found yet another reason for wearing this valuable piece of gear. Several pilots had trouble getting on the rescue seat because of spray being blown in their faces and eyes by the rotors. It was found that by simply lowering the visor, visibility was greatly improved.

In our training work we found the sea anchor to be indispensable during helicopter rescue. If the sea anchor is not deployed or the line connecting it to the raft is too long, there is a strong tendency for the rotors to pick the raft up off the water. No need to go into detail on what will happen if the raft goes through the blades. Suffice it to say that the number of persons requiring rescue would probably be increased by about one helicopter crew. (We are aware of the fact that survivors are supposed to swim away from their rafts but many times they are unable or are just too eager and forget.)

OPERATIONAL AVIATION MEDICINE AND SURVIVAL
2ND MAW

• **Your point about the helmet is very well taken. The concept of remaining in the raft during helicopter rescue was proposed at the VS-HS AirPac Symposium earlier this year and forwarded to BuWeps for consideration and evaluation. APPROACH will publish the findings as soon as they are available.**

"In the soup all the way, ice and turbulence over the mountains, and my wife says I'm lucky to be able to travel."

approach Vol 10 No 3

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

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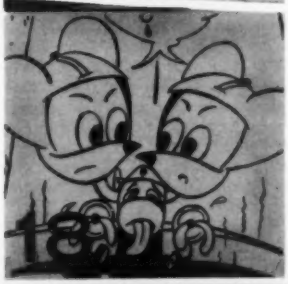

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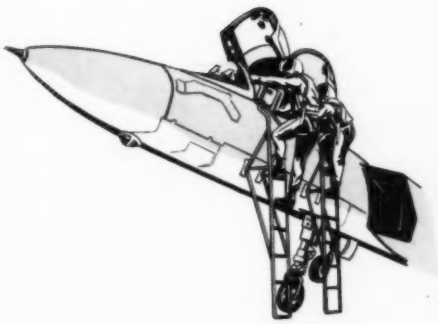


Safety Leadership

LIFT and DRAG

We all have a tendency to try to imitate or take for our own those qualities that we admire and respect in those we identify as our leaders – be these qualities good or bad for us. If the people whom we respect and admire are good, aggressive, professional aviators who create by their interest and actions a good attitude toward flying and safety, then you can bet that our aviation safety program will be good. If, on the other hand, the leader's attitude and actions instill a feeling of unconcern and disinterest in good, professional, aggressive flying, as well as in the flight support effort, then you can bet that the organization will respond with equal enthusiasm to that attitude too. Those who accept the responsibility for leading in aviation must set good examples as professional, aggressive, safety-conscious aviators if they want good safety results. There is no room for a maverick in this assignment.

Morale, which is a product of leadership, plays a vastly important role in the aviation safety effort, since it can so adversely affect the flight support effort. This, in turn, will deny a good safety environment regardless of the attitude of the aviators who fly the aircraft or of the fact that the maintenance personnel are well trained. Aviator morale, on the other hand, can only be assured by good maintenance and good availability, which in turn, insures plenty of flying in mechanically safe aircraft. Maintenance morale is insured by good management practices which include a deep interest, and an abiding concern for the problems of the individual as well as those of the whole maintenance organization. The work of every good man must be recognized and respected as a necessary part of the overall flight effort. Poor work cannot be accepted or tolerated around aircraft.

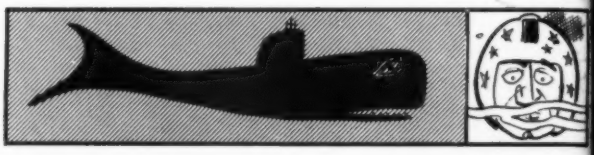
Any job is properly accomplished by first delegating it to those who can and should be doing it, then occasionally checking and acknowledging the fact that it was done properly. At the same time the leader must avoid stifling initiative by over-supervision; and thus taking the initiative away from those junior to him in the chain of command. There is nothing more discouraging than to have this happen. In order to have a good organization the leader must show by his actions that he has confidence in those who work for him. Keep in mind too, that to err is human.

With good leadership we are assured of high morale. This combined with good maintenance training and good quality control will insure good maintenance and flight support.—*The Hot Dope Sheet*

EN GARDE*

"Sandpocket, this is Gobbler One on guard,
request you relay to Operations my request
for four box lunches at 1300Z, over."
"Gobbler One, this is Sandpocket, roger, out."
"M "

"Sandpocket, this is Hunter-killer One, inform
Ops we're in contact with a sub out here.
We're not sure if it's a Russki or a Semi
so we're gonna play around with it a bit more, over.
"Roger, Hunter-killer ASW One."
"MA "



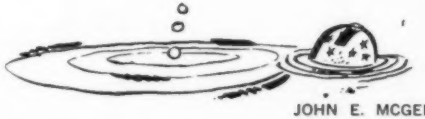
"Sandpocket, this is Air Force Hercules Seven Niner,
Is Joe Bloggins around?"
"Air Force 79, this is Sandpocket, stand by one."
"Sandpocket, this is Echo Echo, test on guard."
"Echo Echo, this is Sandpocket, loud and clear on guard."
"Echo Echo, this is Confusion, how do you hear me on guard."
"MAY "

"Confusion, this is Echo Echo, loud and clear on guard, how me, over?"
"Echo Echo, this is Confusion, loud and clear, out."
"MAYD "

"Air Force 79, this is Sandpocket, over."
"Sandpocket, 79, over."
"79, Joe Bloggins here, over."
"Joe, it's Jim, lotsaluck, we're going down to Florida for a bit of golf and
I thought I'd rub it in a bit."
"Thanks for nothin'. How's Mabel and the kids?"
"Great, little Joe's a real tiger now, how's Sue?"
"MAYDA "

"Fine, fine, well, have fun."
"See ya."
"Yup."
"MAYD "

"Sandpocket, this is Kalamazoo Ace Deuce Triple Nickel on guard, unable to contact
Greenhouse, request you accept my progress, ovah."
"Kalamazoo Triple Nickel, this is Sandpocket, go ahead."
"Roger, Kalamazoo Ace Deuce Triple Nickel was by French Fries at one ninah
maintaining fowah thousand item foxtrot estimating Kleinmund at Flyav
seven Gerhard next, ovah,"
"This is Sandpocket, roger, roger, we check that okay, have a good trip, sir, keep
the ball in the centre."
"Rogah."
"MAY "



"Aircraft calling on guard, this is Sandpocket, go ahead."
"BLUB 0 0 0 0 0 0 0 0 0 0 0 0"

*GARDE — 243.0 Mcs.

JOHN E. MCGEE
RCN WAVEOFF

equest

ut."

d."
guard."

IN

lf and

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SEE
F